

49321-59.ST25.txt
SEQUENCE LISTING

<110> Klein, Michael

Schultz, Dennis

<120> Gene Mutations Associated with Age-Related Macular Degeneration

<130> 49321-59

<160> 11

<170> PatentIn version 3.1

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<211> 18206

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

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<221> variation

<222> (14197)..(14197)

<223> A and G allelic variation exists at this position

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<221> variation

<222> (17811)..(17811)

<223> C and T allelic variation exists at this position

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<221> variation

<222> (17962)..(17962)

<223> C and T allelic variation exists at this position

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49321-59.ST25.txt

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49321-59.ST25.txt

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49321-59.ST25.txt

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49321-59.ST25.txt

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49321-59.ST25.txt

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Ser Ala Gln Glu Ile	Asp	Arg	Gly	Gln	Tyr	Ile	Cys	Val	Ala	Thr		
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49321-59.ST25.txt

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1795 1800 1805	
atg gca gca aat act gct gga gac cac aag aag gaa ttt gaa gtg	5689
Met Ala Ala Asn Thr Ala Gly Asp His Lys Lys Glu Phe Glu Val	
1810 1815 1820	
act gtt cat gtt cct cca aca atc aag tcc tca ggc ctt tct gag	5734
Thr Val His Val Pro Pro Thr Ile Lys Ser Ser Gly Leu Ser Glu	
1825 1830 1835	
aga gtt gtg gta aaa tac aag cct gtc gcc ttg cag tgc ata gcc	5779
Arg Val Val Val Lys Tyr Lys Pro Val Ala Leu Gln Cys Ile Ala	
1840 1845 1850	
aat ggg att cca aat cct tcc att aca tgg tta aaa gat gac cag	5824
Asn Gly Ile Pro Asn Pro Ser Ile Thr Trp Leu Lys Asp Asp Gln	
1855 1860 1865	
cct gtg aac act gcc caa gga aac ctt aaa ata cag tct tct ggt	5869
Pro Val Asn Thr Ala Gln Gly Asn Leu Lys Ile Gln Ser Ser Gly	
1870 1875 1880	
cga gtt cta caa att gcc aaa acc ctg ttg gaa gat gct ggc aga	5914
Arg Val Leu Gln Ile Ala Lys Thr Leu Leu Glu Asp Ala Gly Arg	
1885 1890 1895	
tac aca tgt gtg gct acc aac gca gct gga gaa aca caa cag cac	5959
Tyr Thr Cys Val Ala Thr Asn Ala Ala Gly Glu Thr Gln Gln His	
1900 1905 1910	
att caa ctg cat gtt cat gaa cca cct agt ctg gaa gat gct gga	6004
Ile Gln Leu His Val His Glu Pro Pro Ser Leu Glu Asp Ala Gly	
1915 1920 1925	
aaa atg ctg aat gag act gtg ttg gtg agc aac cct gta cag ctg	6049
Lys Met Leu Asn Glu Thr Val Leu Val Ser Asn Pro Val Gln Leu	
1930 1935 1940	
gag tgt aag gca gct gga aat cct gtg cct gtt att aca tgg tac	6094
Glu Cys Lys Ala Ala Gly Asn Pro Val Pro Val Ile Thr Trp Tyr	
1945 1950 1955	

49321-59.ST25.txt

aaa gat aat cgt cta ctc tca ggt tcc acc agc atg act ttc ttg	6139
Lys Asp Asn Arg Leu Leu Ser Gly Ser Thr Ser Met Thr Phe Leu	
1960 1965 1970	
aac aga gga cag atc att gat att gaa agt gcc cag atc tca gat	6184
Asn Arg Gly Gln Ile Ile Asp Ile Glu Ser Ala Gln Ile Ser Asp	
1975 1980 1985	
gct ggc ata tat aaa tgc gtg gcc atc aac tca gct gga gct aca	6229
Ala Gly Ile Tyr Lys Cys Val Ala Ile Asn Ser Ala Gly Ala Thr	
1990 1995 2000	
gag tta ttt tac agt ctg caa gtt cat gtg gcc cca tca att tct	6274
Glu Leu Phe Tyr Ser Leu Gln Val His Val Ala Pro Ser Ile Ser	
2005 2010 2015	
ggc agc aat aac atg gtg gca gtg gtg gtt aat aac ccg gtg agg	6319
Gly Ser Asn Asn Met Val Ala Val Val Val Asn Asn Pro Val Arg	
2020 2025 2030	
tta gaa tgt gaa gcc aga ggt att cct gcc cca agt ctg acc tgg	6364
Leu Glu Cys Glu Ala Arg Gly Ile Pro Ala Pro Ser Leu Thr Trp	
2035 2040 2045	
ttg aaa gat ggg agt cct gtt tct agt ttt tct aat gga tta cag	6409
Leu Lys Asp Gly Ser Pro Val Ser Ser Phe Ser Asn Gly Leu Gln	
2050 2055 2060	
gtt ctc tct ggt ggt cga atc cta gca ttg acc agt gca caa atc	6454
Val Leu Ser Gly Gly Arg Ile Leu Ala Leu Thr Ser Ala Gln Ile	
2065 2070 2075	
agc gac aca gga agg tac acc tgc gtg gca gtg aat gct gct gga	6499
Ser Asp Thr Gly Arg Tyr Thr Cys Val Ala Val Asn Ala Ala Gly	
2080 2085 2090	
gaa aag caa agg gac att gac ctc cga gta tat gtt ccg cca aat	6544
Glu Lys Gln Arg Asp Ile Asp Leu Arg Val Tyr Val Pro Pro Asn	
2095 2100 2105	
att atg gga gaa gaa cag aat gtc tct gtc ctc att agc caa gct	6589
Ile Met Gly Glu Glu Gln Asn Val Ser Val Leu Ile Ser Gln Ala	
2110 2115 2120	
gtg gaa tta cta tgt caa agt gat gct att ccc cca cct act ctt	6634
Val Glu Leu Leu Cys Gln Ser Asp Ala Ile Pro Pro Pro Thr Leu	
2125 2130 2135	
act tgg tta aaa gac ggc cac ccc ttg ctg aag aaa cca ggc ctc	6679
Thr Trp Leu Lys Asp Gly His Pro Leu Leu Lys Lys Pro Gly Leu	
2140 2145 2150	
agt ata tct gaa aat aga agt gtg tta aag att gaa gat gct cag	6724
Ser Ile Ser Glu Asn Arg Ser Val Leu Lys Ile Glu Asp Ala Gln	
2155 2160 2165	
gtt caa gac act ggt cgt tac act tgt gaa gca aca aat gtt gct	6769
Val Gln Asp Thr Gly Arg Tyr Thr Cys Glu Ala Thr Asn Val Ala	

2170	2175	2180	
gga aaa act gaa aaa aac tac aat gtc aac att tgg gtc ccc cca			6814
Gly Lys Thr Glu Lys Asn Tyr Asn Val Asn Ile Trp Val Pro Pro	2185	2195	
aat att ggt ggt tct gat gaa ctt act caa ctt aca gtc att gaa			6859
Asn Ile Gly Gly Ser Asp Glu Leu Thr Gln Leu Thr Val Ile Glu	2200	2210	
ggg aat ctc att agt ctg ttg tgt gaa tca agt ggt att cca ccc			6904
Gly Asn Leu Ile Ser Leu Leu Cys Glu Ser Ser Gly Ile Pro Pro	2215	2225	
cca aat ctc atc tgg aag aag aaa ggc tct cca gtg ctg act gat			6949
Pro Asn Leu Ile Trp Lys Lys Lys Gly Ser Pro Val Leu Thr Asp	2230	2240	
tcc atg ggg cga gtt aga att tta tct ggg ggc agg caa tta caa			6994
Ser Met Gly Arg Val Arg Ile Leu Ser Gly Gly Arg Gln Leu Gln	2245	2255	
att tca att gct gaa aag tct gat gca gca ctc tat tca tgt gtg			7039
Ile Ser Ile Ala Glu Lys Ser Asp Ala Ala Leu Tyr Ser Cys Val	2260	2270	
gcg tcg aat gtt gct ggg act gca aag aaa gaa tac aat ctg caa			7084
Ala Ser Asn Val Ala Gly Thr Ala Lys Lys Glu Tyr Asn Leu Gln	2275	2285	
gtt tac att aga cca acc ata acc aac agt ggc agc cac cct act			7129
Val Tyr Ile Arg Pro Thr Ile Thr Asn Ser Gly Ser His Pro Thr	2290	2300	
gaa att att gtg acc cga ggg aag agt atc tcc ttg gag tgt gag			7174
Glu Ile Ile Val Thr Arg Gly Lys Ser Ile Ser Leu Glu Cys Glu	2305	2315	
gtg cag ggt att cca cca cca aca gtg acc tgg atg aaa gat ggc			7219
Val Gln Gly Ile Pro Pro Pro Thr Val Thr Trp Met Lys Asp Gly	2320	2330	
cac ccc ttg atc aag gca aag gga gta gaa ata ctg gat gaa ggt			7264
His Pro Leu Ile Lys Ala Lys Gly Val Glu Ile Leu Asp Glu Gly	2335	2345	
cac atc ctt cag ctg aag aac att cat gta tct gac aca ggc cgt			7309
His Ile Leu Gln Leu Lys Asn Ile His Val Ser Asp Thr Gly Arg	2350	2360	
tat gtg tgt gtt gct gtg aat gta gca gga atg act gac aaa aaa			7354
Tyr Val Cys Val Ala Val Asn Val Ala Gly Met Thr Asp Lys Lys	2365	2375	
tat gac tta agt gtc cat gct cct cca agc atc ata gga aac cac			7399
Tyr Asp Leu Ser Val His Ala Pro Pro Ser Ile Ile Gly Asn His	2380	2390	
agg tca cct gaa aat att agt gtg gta gaa aag aac tca gta tct			7444

49321-59.ST25.txt

Arg Ser Pro Glu Asn Ile Ser Val Val Glu Lys Asn Ser Val Ser	
2395 2400 2405	
ttg act tgt gaa gct tct gga att ccc ctg cct tcc ata acc tgg	7489
Leu Thr Cys Glu Ala Ser Gly Ile Pro Leu Pro Ser Ile Thr Trp	
2410 2415 2420	
ttc aaa gat ggg tgg cct gtc agc ctt agc aat tct gtg agg att	7534
Phe Lys Asp Gly Trp Pro Val Ser Leu Ser Asn Ser Val Arg Ile	
2425 2430 2435	
ctt tca gga ggc agg atg cta cgg ctg atg cag acc aca atg gaa	7579
Leu Ser Gly Gly Arg Met Leu Arg Leu Met Gln Thr Thr Met Glu	
2440 2445 2450	
gat gct ggc caa tat act tgc gtt gta agg aat gca gct ggt gaa	7624
Asp Ala Gly Gln Tyr Thr Cys Val Val Arg Asn Ala Ala Gly Glu	
2455 2460 2465	
gaa aga aaa atc ttt ggg ctt tca gta tta gta cca cct cat att	7669
Glu Arg Lys Ile Phe Gly Leu Ser Val Leu Val Pro Pro His Ile	
2470 2475 2480	
gtg ggt gaa aat aca ttg gaa gat gtg aag gta aaa gag aaa cag	7714
Val Gly Glu Asn Thr Leu Glu Asp Val Lys Val Lys Glu Lys Gln	
2485 2490 2495	
agt gtt acg ctg act tgt gaa gtg aca ggg aat cca gtg cca gaa	7759
Ser Val Thr Leu Thr Cys Glu Val Thr Gly Asn Pro Val Pro Glu	
2500 2505 2510	
att aca tgg cac aaa gat ggg cag ccc ctc caa gaa gat gaa gcc	7804
Ile Thr Trp His Lys Asp Gly Gln Pro Leu Gln Glu Asp Glu Ala	
2515 2520 2525	
cat cac att ata tct ggt ggc cgt ttt ctt caa att acc aat gtc	7849
His His Ile Ile Ser Gly Gly Arg Phe Leu Gln Ile Thr Asn Val	
2530 2535 2540	
cag gtg cca cac act gga aga tat aca tgt ttg gct tcc agt cca	7894
Gln Val Pro His Thr Gly Arg Tyr Thr Cys Leu Ala Ser Ser Pro	
2545 2550 2555	
gct ggc cac aag agc agg agc ttc agt ctt aat gta ttt gta tct	7939
Ala Gly His Lys Ser Arg Ser Phe Ser Leu Asn Val Phe Val Ser	
2560 2565 2570	
cct aca att gct ggt gta ggt agt gat ggc aac cct gaa gat gtc	7984
Pro Thr Ile Ala Gly Val Gly Ser Asp Gly Asn Pro Glu Asp Val	
2575 2580 2585	
act gtc atc ctt aac agc cct aca tct ttg gtc tgt gaa gct tat	8029
Thr Val Ile Leu Asn Ser Pro Thr Ser Leu Val Cys Glu Ala Tyr	
2590 2595 2600	
tca tat cct cca gct acc atc acc tgg ttt aag gat ggc act cct	8074
Ser Tyr Pro Pro Ala Thr Ile Thr Trp Phe Lys Asp Gly Thr Pro	
2605 2610 2615	

49321-59.ST25.txt

tta gaa tct aac cga aat att cgt att ctt cca gga ggc aga act	8119
Leu Glu Ser Asn Arg Asn Ile Arg Ile Leu Pro Gly Gly Arg Thr	
2620 2625 2630	
ctg cag atc ctc aat gca cag gag gac aat gct gga aga tac tct	8164
Leu Gln Ile Leu Asn Ala Gln Glu Asp Asn Ala Gly Arg Tyr Ser	
2635 2640 2645	
tgt gta gcc acg aat gag gct gga gaa atg ata aag cac tat gaa	8209
Cys Val Ala Thr Asn Glu Ala Gly Glu Met Ile Lys His Tyr Glu	
2650 2655 2660	
gtg aag gtg tac att cca ccc ata atc aat aaa ggg gac ctt tgg	8254
Val Lys Val Tyr Ile Pro Pro Ile Ile Asn Lys Gly Asp Leu Trp	
2665 2670 2675	
ggg cca ggt ctt tcc cct aaa gaa gtg aag atc aaa gta aac aac	8299
Gly Pro Gly Leu Ser Pro Lys Glu Val Lys Ile Lys Val Asn Asn	
2680 2685 2690	
act ctg acc ttg gaa tgt gaa gcg tat gca att cct tct gcc tcc	8344
Thr Leu Thr Leu Glu Cys Glu Ala Tyr Ala Ile Pro Ser Ala Ser	
2695 2700 2705	
ctc agc tgg tac aag gat gga cag ccc ctt aaa tcc gat gat cat	8389
Leu Ser Trp Tyr Lys Asp Gly Gln Pro Leu Lys Ser Asp Asp His	
2710 2715 2720	
gtt aat att gct gcg aat gga cac aca ctt caa ata aag gag gct	8434
Val Asn Ile Ala Ala Asn Gly His Thr Leu Gln Ile Lys Glu Ala	
2725 2730 2735	
caa ata tca gac acc gga cga tat act tgt gta gca tct aac att	8479
Gln Ile Ser Asp Thr Gly Arg Tyr Thr Cys Val Ala Ser Asn Ile	
2740 2745 2750	
gca ggt gaa gat gag ttg gat ttt gat gtg aat att caa gtt cct	8524
Ala Gly Glu Asp Glu Leu Asp Phe Asp Val Asn Ile Gln Val Pro	
2755 2760 2765	
cca agt ttt cag aaa ctc tgg gaa ata gga aac atg cta gat act	8569
Pro Ser Phe Gln Lys Leu Trp Glu Ile Gly Asn Met Leu Asp Thr	
2770 2775 2780	
ggc agg aat ggt gaa gcc aaa gat gtg atc atc aac aat ccc att	8614
Gly Arg Asn Gly Glu Ala Lys Asp Val Ile Ile Asn Asn Pro Ile	
2785 2790 2795	
tct ctt tac tgt gag aca aat gct gct ccc cct cct aca ctg aca	8659
Ser Leu Tyr Cys Glu Thr Asn Ala Ala Pro Pro Pro Thr Leu Thr	
2800 2805 2810	
tgg tac aaa gat ggc cac cct ctg acc tca agt gat aaa gta ttg	8704
Trp Tyr Lys Asp Gly His Pro Leu Thr Ser Ser Asp Lys Val Leu	
2815 2820 2825	
att ttg cca gga ggg cga gtg ttg cag att cct cgg gct aaa gta	8749
Ile Leu Pro Gly Gly Arg Val Leu Gln Ile Pro Arg Ala Lys Val	
2830 2835 2840	

49321-59.ST25.txt

gaa gat gct ggg aga tac aca tgt gtg gct gtg aat gag gct gga	8794
Glu Asp Ala Gly Arg Tyr Thr Cys Val Ala Val Asn Glu Ala Gly	
2845 2850 2855	
gaa gat tcc ctt caa tat gat gtc cgt gta ctc gtg ccg cca att	8839
Glu Asp Ser Leu Gln Tyr Asp Val Arg Val Leu Val Pro Pro Ile	
2860 2865 2870	
atc aag gga gca aat agt gat ctc cct gaa gag gtc acc gtg ctg	8884
Ile Lys Gly Ala Asn Ser Asp Leu Pro Glu Glu Val Thr Val Leu	
2875 2880 2885	
gtg aac aag agt gca ctg ata gag tgt tta tcc agt ggc agc cca	8929
Val Asn Lys Ser Ala Leu Ile Glu Cys Leu Ser Ser Gly Ser Pro	
2890 2895 2900	
gca cca agg aat tcc tgg cag aaa gat gga cag ccc ttg cta gaa	8974
Ala Pro Arg Asn Ser Trp Gln Lys Asp Gly Gln Pro Leu Leu Glu	
2905 2910 2915	
gat gac cat cat aaa ttt cta tct aat gga cga att ctg cag att	9019
Asp Asp His His Lys Phe Leu Ser Asn Gly Arg Ile Leu Gln Ile	
2920 2925 2930	
ctg aat act caa ata aca gat atc ggc agg tat gtg tgt gtt gct	9064
Leu Asn Thr Gln Ile Thr Asp Ile Gly Arg Tyr Val Cys Val Ala	
2935 2940 2945	
gag aac aca gct ggg agt gcc aaa aaa tat ttt aac ctc aat gtt	9109
Glu Asn Thr Ala Gly Ser Ala Lys Lys Tyr Phe Asn Leu Asn Val	
2950 2955 2960	
cat gtt cct cca agt gtc att ggt cct aaa tct gaa aat ctt acc	9154
His Val Pro Pro Ser Val Ile Gly Pro Lys Ser Glu Asn Leu Thr	
2965 2970 2975	
gtc gtg gtg aac aat ttc atc tct ttg acc tgt gag gtc tct ggt	9199
Val Val Val Asn Asn Phe Ile Ser Leu Thr Cys Glu Val Ser Gly	
2980 2985 2990	
ttt cca cct cct gac ctc agc tgg ctc aag aat gaa cag ccc atc	9244
Phe Pro Pro Pro Asp Leu Ser Trp Leu Lys Asn Glu Gln Pro Ile	
2995 3000 3005	
aaa ctg aac aca aat act ctc att gtg cct ggt ggt cga act cta	9289
Lys Leu Asn Thr Asn Thr Leu Ile Val Pro Gly Gly Arg Thr Leu	
3010 3015 3020	
cag att att cgg gcc aag gta tca gat ggt ggt gaa tac act tgt	9334
Gln Ile Ile Arg Ala Lys Val Ser Asp Gly Gly Glu Tyr Thr Cys	
3025 3030 3035	
ata gct atc aat caa gct ggc gaa agc aag aaa aag ttt tcc ctg	9379
Ile Ala Ile Asn Gln Ala Gly Glu Ser Lys Lys Lys Phe Ser Leu	
3040 3045 3050	
act gtt tat gtg ccc cca agc att aaa gac cat gac agt gaa tct	9424
Thr Val Tyr Val Pro Pro Ser Ile Lys Asp His Asp Ser Glu Ser	

3055	3060	3065	
ctt tct gta gtt aat gta aga gag gga act tct gtg tct ttg gag Leu Ser Val Val Asn Val Arg Glu Gly Thr Ser Val Ser Leu Glu 3070 3075 3080			9469
tgt gag tcg aac gct gtg cca cct cca gtc atc act tgg tat aag Cys Glu Ser Asn Ala Val Pro Pro Pro Val Ile Thr Trp Tyr Lys 3085 3090 3095			9514
aat ggg cgg atg ata aca gag tct act cat gtg gag att tta gct Asn Gly Arg Met Ile Thr Glu Ser Thr His Val Glu Ile Leu Ala 3100 3105 3110			9559
gat gga caa atg cta cac att aag aaa gct gag gta tct gac aca Asp Gly Gln Met Leu His Ile Lys Lys Ala Glu Val Ser Asp Thr 3115 3120 3125			9604
ggc cag tat gta tgt aga gct ata aat gta gca gga cgg gat gat Gly Gln Tyr Val Cys Arg Ala Ile Asn Val Ala Gly Arg Asp Asp 3130 3135 3140			9649
aaa aat ttc cac ctc aat gta tat gtg cca ccc agt att gaa gga Lys Asn Phe His Leu Asn Val Tyr Val Pro Pro Ser Ile Glu Gly 3145 3150 3155			9694
cct gaa aga gaa gtg att gtg gag acg atc agc aat cct gtg aca Pro Glu Arg Glu Val Ile Val Glu Thr Ile Ser Asn Pro Val Thr 3160 3165 3170			9739
tta aca tgt gat gcc act ggg atc cca cct ccc acg ata gca tgg Leu Thr Cys Asp Ala Thr Gly Ile Pro Pro Pro Thr Ile Ala Trp 3175 3180 3185			9784
tta aag aac cac aag cgc ata gaa aat tct gac tca ctg gaa gtt Leu Lys Asn His Lys Arg Ile Glu Asn Ser Asp Ser Leu Glu Val 3190 3195 3200			9829
cgt att ttg tct gga ggt agc aaa ctc cag att gcc cgg tct cag Arg Ile Leu Ser Gly Gly Ser Lys Leu Gln Ile Ala Arg Ser Gln 3205 3210 3215			9874
cat tca gat agt gga aac tat aca tgt att gct tca aat atg gag His Ser Asp Ser Gly Asn Tyr Thr Cys Ile Ala Ser Asn Met Glu 3220 3225 3230			9919
gga aaa gcc cag aaa tat tac ttt ctt tca att caa gtt cct cca Gly Lys Ala Gln Lys Tyr Tyr Phe Leu Ser Ile Gln Val Pro Pro 3235 3240 3245			9964
agt gtt gct ggt gct gaa att cca agt gat gtc agt gtc ctt cta Ser Val Ala Gly Ala Glu Ile Pro Ser Asp Val Ser Val Leu Leu 3250 3255 3260			10009
gga gaa aat gtt gag ctg gtc tgc aat gca aat ggc att cct act Gly Glu Asn Val Glu Leu Val Cys Asn Ala Asn Gly Ile Pro Thr 3265 3270 3275			10054
cca ctt att caa tgg ctt aaa gat gga aag ccc ata gct agt ggt			10099

49321-59.ST25.txt

Pro Leu Ile Gln Trp	Leu Lys Asp Gly Lys	Pro Ile Ala Ser Gly	
3280	3285	3290	
gaa aca gaa aga atc	cga gtg agt gca aat	ggc agc aca tta aac	10144
Glu Thr Glu Arg Ile	Arg Val Ser Ala Asn	Gly Ser Thr Leu Asn	
3295	3300	3305	
att tat gga gct ctt	aca tct gac acg ggg	aaa tac aca tgt gtt	10189
Ile Tyr Gly Ala Leu	Thr Ser Asp Thr Gly	Lys Tyr Thr Cys Val	
3310	3315	3320	
gct act aat ccc gct	gga gaa gaa gac cga	att ttt aac ttg aat	10234
Ala Thr Asn Pro Ala	Gly Glu Glu Asp Arg	Ile Phe Asn Leu Asn	
3325	3330	3335	
gtc tat gtt aca cct	aca att agg ggt aat	aaa gat gaa gca gag	10279
Val Tyr Val Thr Pro	Thr Ile Arg Gly Asn	Lys Asp Glu Ala Glu	
3340	3345	3350	
aaa cta atg act tta	gtg gat act tca ata	aat att gaa tgc aga	10324
Lys Leu Met Thr Leu	Val Asp Thr Ser Ile	Asn Ile Glu Cys Arg	
3355	3360	3365	
gcc aca ggg acg cct	cca cca cag ata aac	tgg ctg aag aat gga	10369
Ala Thr Gly Thr Pro	Pro Pro Gln Ile Asn	Trp Leu Lys Asn Gly	
3370	3375	3380	
ctt cct ctg cct ctc	tcc tcc cat atc cgg	tta ctg gca gca gga	10414
Leu Pro Leu Pro Leu	Ser Ser His Ile Arg	Leu Leu Ala Ala Gly	
3385	3390	3395	
caa gtt atc agg att	gtg aga gct cag gtg	tct gat gtc gct gtg	10459
Gln Val Ile Arg Ile	Val Arg Ala Gln Val	Ser Asp Val Ala Val	
3400	3405	3410	
tat act tgt gtg gcc	tcc aac aga gct ggg	gtg gat aat aag cat	10504
Tyr Thr Cys Val Ala	Ser Asn Arg Ala Gly	Val Asp Asn Lys His	
3415	3420	3425	
tac aat ctt caa gtg	ttt gca cca cca aat	atg gac aat tca atg	10549
Tyr Asn Leu Gln Val	Phe Ala Pro Pro Asn	Met Asp Asn Ser Met	
3430	3435	3440	
ggg aca gag gaa atc	aca gtt ctc aaa ggt	agt tcc acc tct atg	10594
Gly Thr Glu Glu Ile	Thr Val Leu Lys Gly	Ser Ser Thr Ser Met	
3445	3450	3455	
gca tgc att act gat	gga acc cca gct ccc	agt atg gcc tgg ctt	10639
Ala Cys Ile Thr Asp	Gly Thr Pro Ala Pro	Ser Met Ala Trp Leu	
3460	3465	3470	
aga gat ggc cag cct	ctg ggg ctt gat gcc	cat ctg aca gtc agc	10684
Arg Asp Gly Gln Pro	Leu Gly Leu Asp Ala	His Leu Thr Val Ser	
3475	3480	3485	
acc cat gga atg gtc	ctg cag ctc ctc aaa	gca gag act gaa gat	10729
Thr His Gly Met Val	Leu Gln Leu Leu Lys	Ala Glu Thr Glu Asp	
3490	3495	3500	

49321-59.ST25.txt

tcg gga aag tac acc	tgc att gcc tca aat	gaa gct gga gaa gtc	10774
Ser Gly Lys Tyr Thr	Cys Ile Ala Ser Asn	Glu Ala Gly Glu Val	
3505	3510	3515	
agc aag cac ttt atc	ctc aag gtc cta gaa	cca cct cac att aat	10819
Ser Lys His Phe Ile	Leu Lys Val Leu Glu	Pro Pro His Ile Asn	
3520	3525	3530	
gga tct gaa gaa cat	gaa gag ata tca gta	att gtt aat aac cca	10864
Gly Ser Glu Glu His	Glu Glu Ile Ser Val	Ile Val Asn Asn Pro	
3535	3540	3545	
ctt gaa ctt acc tgc	att gct tct gga atc	cca gcc cct aaa atg	10909
Leu Glu Leu Thr Cys	Ile Ala Ser Gly Ile	Pro Ala Pro Lys Met	
3550	3555	3560	
acc tgg atg aaa gat	ggc cgg ccc ctt cca	cag acg gat caa gtg	10954
Thr Trp Met Lys Asp	Gly Arg Pro Leu Pro	Gln Thr Asp Gln Val	
3565	3570	3575	
caa act cta gga gga	gga gag gtt ctt cga	att tct act gct cag	10999
Gln Thr Leu Gly Gly	Gly Glu Val Leu Arg	Ile Ser Thr Ala Gln	
3580	3585	3590	
gtg gag gat aca gga	aga tat aca tgt ctg	gca tcc agt cct gca	11044
Val Glu Asp Thr Gly	Arg Tyr Thr Cys Leu	Ala Ser Ser Pro Ala	
3595	3600	3605	
gga gat gat gat aag	gaa tat cta gtg aga	gtg cat gta cct cct	11089
Gly Asp Asp Asp Lys	Glu Tyr Leu Val Arg	Val His Val Pro Pro	
3610	3615	3620	
aat att gct gga act	gat gag ccc cgg gat	atc act gtg tta cgg	11134
Asn Ile Ala Gly Thr	Asp Glu Pro Arg Asp	Ile Thr Val Leu Arg	
3625	3630	3635	
aac aga caa gtg aca	ttg gaa tgc aag tca	gat gca gtg ccc cca	11179
Asn Arg Gln Val Thr	Leu Glu Cys Lys Ser	Asp Ala Val Pro Pro	
3640	3645	3650	
cct gta att act tgg	ctc aga aat gga gaa	cgg tta cag gca aca	11224
Pro Val Ile Thr Trp	Leu Arg Asn Gly Glu	Arg Leu Gln Ala Thr	
3655	3660	3665	
cct cga gtg cga atc	cta tct gga ggg aga	tac ttg caa atc aac	11269
Pro Arg Val Arg Ile	Leu Ser Gly Gly Arg	Tyr Leu Gln Ile Asn	
3670	3675	3680	
aat gct gac cta ggt	gat aca gcc aat tat	acc tgt gtt gcc agc	11314
Asn Ala Asp Leu Gly	Asp Thr Ala Asn Tyr	Thr Cys Val Ala Ser	
3685	3690	3695	
aac att gca gga aag	act aca aga gaa ttt	att ctc act gta aat	11359
Asn Ile Ala Gly Lys	Thr Thr Arg Glu Phe	Ile Leu Thr Val Asn	
3700	3705	3710	
gtt cct cca aac ata	aag ggg ggc ccc cag	agc ctt gta att ctt	11404
Val Pro Pro Asn Ile	Lys Gly Gly Pro Gln	Ser Leu Val Ile Leu	
3715	3720	3725	

49321-59.ST25.txt

tta aat aag tca act	gta ttg gaa tgc atc	gct gaa ggt gtg cca	11449
Leu Asn Lys Ser Thr	Val Leu Glu Cys Ile	Ala Glu Gly Val Pro	
3730	3735	3740	
act cca agg ata aca	tgga aga aag gat gga	gct gtt cta gct ggg	11494
Thr Pro Arg Ile Thr	Trp Arg Lys Asp Gly	Ala Val Leu Ala Gly	
3745	3750	3755	
aat cat gca aga tat	tcc atc ttg gaa aat	gga ttc ctt cat att	11539
Asn His Ala Arg Tyr	Ser Ile Leu Glu Asn	Gly Phe Leu His Ile	
3760	3765	3770	
caa tca gca cat gtc	act gac act gga cgg	tat ttg tgt atg gcc	11584
Gln Ser Ala His Val	Thr Asp Thr Gly Arg	Tyr Leu Cys Met Ala	
3775	3780	3785	
acc aat gct gct gga	aca gat cgc agg cga	ata gat tta cag gtc	11629
Thr Asn Ala Ala Gly	Thr Asp Arg Arg Arg	Ile Asp Leu Gln Val	
3790	3795	3800	
cat gtt cct cca tct	att gct ccg ggt cct	acc aac atg act gta	11674
His Val Pro Pro Ser	Ile Ala Pro Gly Pro	Thr Asn Met Thr Val	
3805	3810	3815	
ata gta aat gtt caa	act act ctg gct tgt	gag gct act ggg ata	11719
Ile Val Asn Val Gln	Thr Thr Leu Ala Cys	Glu Ala Thr Gly Ile	
3820	3825	3830	
cca aaa cca tca atc	aat tgg aga aaa aat	ggg cat ctt ctt aat	11764
Pro Lys Pro Ser Ile	Asn Trp Arg Lys Asn	Gly His Leu Leu Asn	
3835	3840	3845	
gtg gat caa aat cag	aac tca tac agg ctc	ctt tct tca ggt tca	11809
Val Asp Gln Asn Gln	Asn Ser Tyr Arg Leu	Leu Ser Ser Gly Ser	
3850	3855	3860	
cta gta att att tcc	cct tct gtg gat gac	act gca acc tat gaa	11854
Leu Val Ile Ile Ser	Pro Ser Val Asp Asp	Thr Ala Thr Tyr Glu	
3865	3870	3875	
tgt act gtg aca aac	ggg gct gga gat gat	aaa aga act gtg gat	11899
Cys Thr Val Thr Asn	Gly Ala Gly Asp Asp	Lys Arg Thr Val Asp	
3880	3885	3890	
ctc act gtc caa gtt	cca cct tcc ata gct	gat gag cct aca gat	11944
Leu Thr Val Gln Val	Pro Pro Ser Ile Ala	Asp Glu Pro Thr Asp	
3895	3900	3905	
ttc cta gta acc aaa	cat gcc cca gca gta	att acc tgc act gct	11989
Phe Leu Val Thr Lys	His Ala Pro Ala Val	Ile Thr Cys Thr Ala	
3910	3915	3920	
tcg gga gtt cca ttt	ccc tca att cac tgg	acc aaa aat ggt ata	12034
Ser Gly Val Pro Phe	Pro Ser Ile His Trp	Thr Lys Asn Gly Ile	
3925	3930	3935	
aga ctg ctt ccc agg	gga gat ggc tat aga	att ctg tcc tca gga	12079
Arg Leu Leu Pro Arg	Gly Asp Gly Tyr Arg	Ile Leu Ser Ser Gly	

49321-59.ST25.txt

3940	3945	3950	
gca att gaa ata ctt gcc acc caa tta aac cat gct gga aga tac			12124
Ala Ile Glu Ile Leu Ala Thr Gln Leu Asn His Ala Gly Arg Tyr			
3955	3960	3965	
act tgt gtc gct agg aat gcg gct ggc tct gca cat cga cac gtg			12169
Thr Cys Val Ala Arg Asn Ala Ala Gly Ser Ala His Arg His Val			
3970	3975	3980	
acc ctt cat gtt cat gag cct cca gtc att cag ccc caa cca agt			12214
Thr Leu His Val His Glu Pro Pro Val Ile Gln Pro Gln Pro Ser			
3985	3990	3995	
gaa cta cac gtc att ctg aac aat cct att tta tta cca tgt gaa			12259
Glu Leu His Val Ile Leu Asn Asn Pro Ile Leu Leu Pro Cys Glu			
4000	4005	4010	
gca aca ggg aca ccc agt cct ttc att act tgg caa aaa gaa ggc			12304
Ala Thr Gly Thr Pro Ser Pro Phe Ile Thr Trp Gln Lys Glu Gly			
4015	4020	4025	
atc aat gtt aac act tca ggc aga aac cat gca gtt ctt cct agt			12349
Ile Asn Val Asn Thr Ser Gly Arg Asn His Ala Val Leu Pro Ser			
4030	4035	4040	
ggc ggc tta cag atc tcc aga gct gtc cga gag gat gct ggc act			12394
Gly Gly Leu Gln Ile Ser Arg Ala Val Arg Glu Asp Ala Gly Thr			
4045	4050	4055	
tac atg tgt gtg gcc cag aac ccg gct ggt aca gcc ttg ggc aaa			12439
Tyr Met Cys Val Ala Gln Asn Pro Ala Gly Thr Ala Leu Gly Lys			
4060	4065	4070	
atc aag tta aat gtc caa gtt cct cca gtc att agc cct cat cta			12484
Ile Lys Leu Asn Val Gln Val Pro Pro Val Ile Ser Pro His Leu			
4075	4080	4085	
aag gaa tat gtt att gct gtg gac aag ccc atc acg tta tcc tgt			12529
Lys Glu Tyr Val Ile Ala Val Asp Lys Pro Ile Thr Leu Ser Cys			
4090	4095	4100	
gaa gca gat ggc ctc cct ccg cct gac att aca tgg cat aaa gat			12574
Glu Ala Asp Gly Leu Pro Pro Pro Asp Ile Thr Trp His Lys Asp			
4105	4110	4115	
ggg cgt gca att gtg gaa tct atc cgc cag cgc gtc ctc agc tct			12619
Gly Arg Ala Ile Val Glu Ser Ile Arg Gln Arg Val Leu Ser Ser			
4120	4125	4130	
ggc tct ctg caa ata gca ttt gtc cag cct ggt gat gct ggc cat			12664
Gly Ser Leu Gln Ile Ala Phe Val Gln Pro Gly Asp Ala Gly His			
4135	4140	4145	
tac acg tgc atg gca gcc aat gta gca gga tca agc agc aca agc			12709
Tyr Thr Cys Met Ala Ala Asn Val Ala Gly Ser Ser Ser Thr Ser			
4150	4155	4160	
acc aag ctc acc gtc cat gta cca ccc agg atc aga agt aca gaa			12754

49321-59.ST25.txt

Thr Lys Leu Thr Val	His Val Pro Pro Arg Ile Arg Ser Thr Glu	
4165	4170	4175
gga' cac tac acg gtc	aat gag aat tca caa gcc att ctt cca tgc	12799
Gly His Tyr Thr Val	Asn Glu Asn Ser Gln Ala Ile Leu Pro Cys	
4180	4185	4190
gta gct gat gga atc	ccc aca cca gca att aac tgg aaa aaa gac	12844
Val Ala Asp Gly Ile	Pro Thr Pro Ala Ile Asn Trp Lys Lys Asp	
4195	4200	4205
aat gtt ctt tta gct	aac ttg tta gga aaa tac act gct gaa cca	12889
Asn Val Leu Leu Ala	Asn Leu Leu Gly Lys Tyr Thr Ala Glu Pro	
4210	4215	4220
tat gga gaa ctc att	tta gaa aat gtt gtg ctg gag gat tct ggc	12934
Tyr Gly Glu Leu Ile	Leu Glu Asn Val Val Leu Glu Asp Ser Gly	
4225	4230	4235
ttc tat acc tgt gtt	gct aac aat gct gca ggt gaa gat aca cac	12979
Phe Tyr Thr Cys Val	Ala Asn Asn Ala Ala Gly Glu Asp Thr His	
4240	4245	4250
act gtc agc ctg act	gtg cat gtt ctc ccc act ttt act gaa ctt	13024
Thr Val Ser Leu Thr	Val His Val Leu Pro Thr Phe Thr Glu Leu	
4255	4260	4265
cct gga gac gtg tca	tta aat aaa gga gaa cag cta cga tta agc	13069
Pro Gly Asp Val Ser	Leu Asn Lys Gly Glu Gln Leu Arg Leu Ser	
4270	4275	4280
tgt aaa gct act ggt	att cca ttg ccc aaa tta aca tgg acc ttc	13114
Cys Lys Ala Thr Gly	Ile Pro Leu Pro Lys Leu Thr Trp Thr Phe	
4285	4290	4295
aat aac aat att att	cca gcc cac ttt gac agt gtg aat gga cac	13159
Asn Asn Asn Ile Ile	Pro Ala His Phe Asp Ser Val Asn Gly His	
4300	4305	4310
agt gaa ctt gtt att	gaa aga gtg tca aaa gag gat tca ggt act	13204
Ser Glu Leu Val Ile	Glu Arg Val Ser Lys Glu Asp Ser Gly Thr	
4315	4320	4325
tat gtg tgc acc gca	gag aac agc gtt ggc ttt gtg aag gca att	13249
Tyr Val Cys Thr Ala	Glu Asn Ser Val Gly Phe Val Lys Ala Ile	
4330	4335	4340
gga ttt gtt tat gtg	aaa gaa cct cca gtc ttc aaa ggt gat tat	13294
Gly Phe Val Tyr Val	Lys Glu Pro Pro Val Phe Lys Gly Asp Tyr	
4345	4350	4355
cct tct aac tgg att	gaa cca ctt ggt ggg aat gca atc ctg aat	13339
Pro Ser Asn Trp Ile	Glu Pro Leu Gly Gly Asn Ala Ile Leu Asn	
4360	4365	4370
tgt gag gtg aaa gga	gac ccc acc cca acc atc cag tgg aac aga	13384
Cys Glu Val Lys Gly	Asp Pro Thr Pro Thr Ile Gln Trp Asn Arg	
4375	4380	4385

49321-59.ST25.txt

aag gga gtg gat att gaa att agc cac aga atc cgg caa ctg ggc Lys Gly Val Asp Ile Glu Ile Ser His Arg Ile Arg Gln Leu Gly 4390 4395 4400	13429
aat ggc tcc ctg gcc atc tat ggc act gtt aat gaa gat gcc ggt Asn Gly Ser Leu Ala Ile Tyr Gly Thr Val Asn Glu Asp Ala Gly 4405 4410 4415	13474
gac tat aca tgt gta gct acc aat gaa gct ggg gtg gtg gag cgc Asp Tyr Thr Cys Val Ala Thr Asn Glu Ala Gly Val Val Glu Arg 4420 4425 4430	13519
agc atg agt ctg act ctg caa agt cct cct att atc act ctt gag Ser Met Ser Leu Thr Leu Gln Ser Pro Pro Ile Ile Thr Leu Glu 4435 4440 4445	13564
cca gtg gaa act gtt att aat gct ggt ggc aaa atc ata ttg aat Pro Val Glu Thr Val Ile Asn Ala Gly Gly Lys Ile Ile Leu Asn 4450 4455 4460	13609
tgt cag gca act gga gag cct caa cca acc att aca tgg tcc cgt Cys Gln Ala Thr Gly Glu Pro Gln Pro Thr Ile Thr Trp Ser Arg 4465 4470 4475	13654
caa ggg cac tct att tcc tgg gat gac cgg gtt aac gtg ttg tcc Gln Gly His Ser Ile Ser Trp Asp Asp Arg Val Asn Val Leu Ser 4480 4485 4490	13699
aac aac tca tta tat att gct gat gct cag aaa gaa gat acc tct Asn Asn Ser Leu Tyr Ile Ala Asp Ala Gln Lys Glu Asp Thr Ser 4495 4500 4505	13744
gaa ttt gaa tgt gtt gct cga aac tta atg ggt tct gtc ctt gtc Glu Phe Glu Cys Val Ala Arg Asn Leu Met Gly Ser Val Leu Val 4510 4515 4520	13789
aga gtg cca gtc ata gtc cag gtt cat ggt gga ttt tcc cag tgg Arg Val Pro Val Ile Val Gln Val His Gly Gly Phe Ser Gln Trp 4525 4530 4535	13834
tct gca tgg aga gcc tgc agt gtc acc tgt gga aaa ggc atc caa Ser Ala Trp Arg Ala Cys Ser Val Thr Cys Gly Lys Gly Ile Gln 4540 4545 4550	13879
aag agg agt cgt ctg tgc aac cag ccc ctt cca gcc aat ggt ggg Lys Arg Ser Arg Leu Cys Asn Gln Pro Leu Pro Ala Asn Gly Gly 4555 4560 4565	13924
aag ccc tgc caa ggt tca gat ttg gaa atg cga aac tgt caa aat Lys Pro Cys Gln Gly Ser Asp Leu Glu Met Arg Asn Cys Gln Asn 4570 4575 4580	13969
aag cct tgt cca gtg gat ggt agc tgg tcg gaa tgg agt ctt tgg Lys Pro Cys Pro Val Asp Gly Ser Trp Ser Glu Trp Ser Leu Trp 4585 4590 4595	14014
gaa gaa tgc aca agg agc tgt gga cgc ggc aac caa acc agg acc Glu Glu Cys Thr Arg Ser Cys Gly Arg Gly Asn Gln Thr Arg Thr 4600 4605 4610	14059

agg act tgc aat aat cca tca gtt cag cat ggt ggg cgg cca tgt	14104
Arg Thr Cys Asn Asn Pro Ser Val Gln His Gly Gly Arg Pro Cys	
4615 4620 4625	
gaa ggg aat gct gtg gaa ata att atg tgc aac att agg cct tgc	14149
Glu Gly Asn Ala Val Glu Ile Ile Met Cys Asn Ile Arg Pro Cys	
4630 4635 4640	
cca gtt cat gga gca tgg agc gct tgg cag cct tgg gga aca tgc	14194
Pro Val His Gly Ala Trp Ser Ala Trp Gln Pro Trp Gly Thr Cys	
4645 4650 4655	
agc gaa agt tgt ggg aaa ggt act cag aca aga gca aga ctt tgt	14239
Ser Glu Ser Cys Gly Lys Gly Thr Gln Thr Arg Ala Arg Leu Cys	
4660 4665 4670	
aat aac cca cca cca gcg ttt ggt ggg tcc tac tgt gat gga gca	14284
Asn Asn Pro Pro Pro Ala Phe Gly Gly Ser Tyr Cys Asp Gly Ala	
4675 4680 4685	
gaa aca cag atg caa gtt tgc aat gaa aga aat tgt cca att cat	14329
Glu Thr Gln Met Gln Val Cys Asn Glu Arg Asn Cys Pro Ile His	
4690 4695 4700	
ggc aag tgg gcg act tgg gcc agt tgg agt gcc tgt tct gtg tca	14374
Gly Lys Trp Ala Thr Trp Ala Ser Trp Ser Ala Cys Ser Val Ser	
4705 4710 4715	
tgt gga gga ggt gcc aga cag aga aca agg ggc tgc tcc gac cct	14419
Cys Gly Gly Gly Ala Arg Gln Arg Thr Arg Gly Cys Ser Asp Pro	
4720 4725 4730	
gtg ccc cag tat gga gga agg aaa tgc gaa ggg agt gat gtc cag	14464
Val Pro Gln Tyr Gly Gly Arg Lys Cys Glu Gly Ser Asp Val Gln	
4735 4740 4745	
agt gat ttt tgc aac agt gac cct tgc cca acc cat ggt aac tgg	14509
Ser Asp Phe Cys Asn Ser Asp Pro Cys Pro Thr His Gly Asn Trp	
4750 4755 4760	
agt cct tgg agt ggc tgg gga aca tgc agc cgg acg tgt aac gga	14554
Ser Pro Trp Ser Gly Trp Gly Thr Cys Ser Arg Thr Cys Asn Gly	
4765 4770 4775	
ggg cag atg cgg cgg tac cgc aca tgt gat aac cct cct ccc tcc	14599
Gly Gln Met Arg Arg Tyr Arg Thr Cys Asp Asn Pro Pro Pro Ser	
4780 4785 4790	
aat ggg gga aga gct tgt ggg gga cca gac tcc cag atc cag agg	14644
Asn Gly Gly Arg Ala Cys Gly Gly Pro Asp Ser Gln Ile Gln Arg	
4795 4800 4805	
tgc aac act gac atg tgt cct gtg gat gga agt tgg gga agc tgg	14689
Cys Asn Thr Asp Met Cys Pro Val Asp Gly Ser Trp Gly Ser Trp	
4810 4815 4820	
cat agt tgg agc cag tgc tct gcc tcc tgt gga gga ggt gaa aag	14734
His Ser Trp Ser Gln Cys Ser Ala Ser Cys Gly Gly Gly Glu Lys	

49321-59.ST25.txt

4825	4830	4835	
act cgg aag cgg ctg tgc gac cat cct gtg cca gtt aaa ggt ggc			14779
Thr Arg Lys Arg Leu Cys Asp His Pro Val Pro Val Lys Gly Gly	4840	4850	
cgt ccc tgt ccc gga gac act act cag gtg acc agg tgc aat gta			14824
Arg Pro Cys Pro Gly Asp Thr Thr Gln Val Thr Arg Cys Asn Val	4855	4865	
caa gca tgt cca ggt ggg ccc cag cga gcc aga gga agt gtt att			14869
Gln Ala Cys Pro Gly Gly Pro Gln Arg Ala Arg Gly Ser Val Ile	4870	4880	
gga aat att aat gat gtt gaa ttt gga att gct ttc ctt aat gcc			14914
Gly Asn Ile Asn Asp Val Glu Phe Gly Ile Ala Phe Leu Asn Ala	4885	4895	
aca ata act gat agc cct aac tct gat act aga ata ata cgt gcc			14959
Thr Ile Thr Asp Ser Pro Asn Ser Asp Thr Arg Ile Ile Arg Ala	4900	4910	
aaa att acc aat gta cct cgt agt ctt ggt tca gca atg aga aag			15004
Lys Ile Thr Asn Val Pro Arg Ser Leu Gly Ser Ala Met Arg Lys	4915	4925	
ata gtt tct att cta aat ccc att tat tgg aca aca gca aag gaa			15049
Ile Val Ser Ile Leu Asn Pro Ile Tyr Trp Thr Thr Ala Lys Glu	4930	4940	
ata gga gaa gca gtc aat ggc ttt acc ctc acc aat gca gtc ttc			15094
Ile Gly Glu Ala Val Asn Gly Phe Thr Leu Thr Asn Ala Val Phe	4945	4955	
aaa aga gaa act caa gtg gaa ttt gca act gga gaa atc ttg cag			15139
Lys Arg Glu Thr Gln Val Glu Phe Ala Thr Gly Glu Ile Leu Gln	4960	4970	
atg agt cat att gcc cgg ggc ttg gat tcc gat ggt tct ttg ctg			15184
Met Ser His Ile Ala Arg Gly Leu Asp Ser Asp Gly Ser Leu Leu	4975	4985	
cta gat atc gtt gtg agt ggc tat gtc cta cag ctt cag tca cct			15229
Leu Asp Ile Val Val Ser Gly Tyr Val Leu Gln Leu Gln Ser Pro	4990	5000	
gct gaa gtc act gta aag gat tac aca gag gac tac att caa aca			15274
Ala Glu Val Thr Val Lys Asp Tyr Thr Glu Asp Tyr Ile Gln Thr	5005	5015	
ggt cct ggg cag ctg tac gcc tac tca acc cgg ctg ttc acc att			15319
Gly Pro Gly Gln Leu Tyr Ala Tyr Ser Thr Arg Leu Phe Thr Ile	5020	5030	
gat ggc atc agc atc cca tac aca tgg aac cac acc gtt ttc tat			15364
Asp Gly Ile Ser Ile Pro Tyr Thr Trp Asn His Thr Val Phe Tyr	5035	5045	
gat cag gca cag gga aga atg cct ttc ttg gtt gaa aca ctt cat			15409

49321-59.ST25.txt

Asp Gln Ala Gln Gly	Arg Met Pro Phe Leu	Val Glu Thr Leu His	5050	5055	5060
gca tcc tct gtg gaa	tct gac tat aac cag	ata gaa gag aca ctg	15454		
Ala Ser Ser Val Glu	Ser Asp Tyr Asn Gln	Ile Glu Glu Thr Leu	5065	5070	5075
ggt ttt aaa att cat	gct tca ata tcc aaa	gga gat cgc agt aat	15499		
Gly Phe Lys Ile His	Ala Ser Ile Ser Lys	Gly Asp Arg Ser Asn	5080	5085	5090
cag tgc ccc tcc ggg	ttt acc tta gac tca	gtt gga cct ttt tgt	15544		
Gln Cys Pro Ser Gly	Phe Thr Leu Asp Ser	Val Gly Pro Phe Cys	5095	5100	5105
gct gat gag gat gaa	tgt gca gca ggg aat	ccc tgc tcc cat agc	15589		
Ala Asp Glu Asp Glu	Cys Ala Ala Gly Asn	Pro Cys Ser His Ser	5110	5115	5120
tgc cac aat gcc atg	ggg act tac tac tgc	tcc tgc cct aaa ggc	15634		
Cys His Asn Ala Met	Gly Thr Tyr Tyr Cys	Ser Cys Pro Lys Gly	5125	5130	5135
ctc acc ata gct gca	gat gga aga act tgt	caa gat att gat gag	15679		
Leu Thr Ile Ala Ala	Asp Gly Arg Thr Cys	Gln Asp Ile Asp Glu	5140	5145	5150
tgt gct ttg ggt agg	cat acc tgc cac gct	ggg cag gac tgt gac	15724		
Cys Ala Leu Gly Arg	His Thr Cys His Ala	Gly Gln Asp Cys Asp	5155	5160	5165
aat acg att gga tct	tat cgc tgt gtg gtc	cgt tgt gga agt ggc	15769		
Asn Thr Ile Gly Ser	Tyr Arg Cys Val Val	Arg Cys Gly Ser Gly	5170	5175	5180
ttt cga aga acc tct	gat ggg ctg agt tgt	caa gat att aat gaa	15814		
Phe Arg Arg Thr Ser	Asp Gly Leu Ser Cys	Gln Asp Ile Asn Glu	5185	5190	5195
tgt caa gaa tcc agc	ccc tgt cac cag cgc	tgt ttc aat gcc ata	15859		
Cys Gln Glu Ser Ser	Pro Cys His Gln Arg	Cys Phe Asn Ala Ile	5200	5205	5210
gga agt ttc cat tgt	gga tgt gaa cct ggg	tat cag ctc aaa ggc	15904		
Gly Ser Phe His Cys	Gly Cys Glu Pro Gly	Tyr Gln Leu Lys Gly	5215	5220	5225
aga aaa tgc atg gat	gtg aac gag tgt aga	caa aat gta tgc aga	15949		
Arg Lys Cys Met Asp	Val Asn Glu Cys Arg	Gln Asn Val Cys Arg	5230	5235	5240
cca gat cag cac tgt	aag aac acc cgt ggt	ggc tat aag tgc att	15994		
Pro Asp Gln His Cys	Lys Asn Thr Arg Gly	Gly Tyr Lys Cys Ile	5245	5250	5255
gat ctt tgt cca aat	gga atg acc aag gca	gaa aat gga acc tgt	16039		
Asp Leu Cys Pro Asn	Gly Met Thr Lys Ala	Glu Asn Gly Thr Cys	5260	5265	5270

49321-59.ST25.txt

att gat att gat gaa tgt aaa gat ggg acc cat cag tgc aga tat	16084
Ile Asp Ile Asp Glu Cys Lys Asp Gly Thr His Gln Cys Arg Tyr	
5275 5280 5285	
aac cag ata tgt gag aat aca aga ggc agc tat cgt tgt gta tgc	16129
Asn Gln Ile Cys Glu Asn Thr Arg Gly Ser Tyr Arg Cys Val Cys	
5290 5295 5300	
cca aga ggt tat cgg tct caa gga gtt gga aga ccc tgc atg gac	16174
Pro Arg Gly Tyr Arg Ser Gln Gly Val Gly Arg Pro Cys Met Asp	
5305 5310 5315	
att aat gaa tgt gaa caa gtg cct aaa cct tgt gca cat cag tgc	16219
Ile Asn Glu Cys Glu Gln Val Pro Lys Pro Cys Ala His Gln Cys	
5320 5325 5330	
tcc aac acc ccc ggc agc ttc aag tgt atc tgt cca cca gga caa	16264
Ser Asn Thr Pro Gly Ser Phe Lys Cys Ile Cys Pro Pro Gly Gln	
5335 5340 5345	
cat tta tta ggg gac ggg aaa tct tgc gct gga ttg gag agg ctg	16309
His Leu Leu Gly Asp Gly Lys Ser Cys Ala Gly Leu Glu Arg Leu	
5350 5355 5360	
cca aat tat ggc act caa tac agt agc tat aac ctt gca cgg ttc	16354
Pro Asn Tyr Gly Thr Gln Tyr Ser Ser Tyr Asn Leu Ala Arg Phe	
5365 5370 5375	
tcc cct gtg aga aac aac tat caa cct caa cag cat tac aga cag	16399
Ser Pro Val Arg Asn Asn Tyr Gln Pro Gln Gln His Tyr Arg Gln	
5380 5385 5390	
tac tca cat ctc tac agc tcc tac tca gag tat aga aac agc aga	16444
Tyr Ser His Leu Tyr Ser Ser Tyr Ser Glu Tyr Arg Asn Ser Arg	
5395 5400 5405	
aca tct ctc tcc agg act aga agg act att agg aaa act tgc cct	16489
Thr Ser Leu Ser Arg Thr Arg Arg Thr Ile Arg Lys Thr Cys Pro	
5410 5415 5420	
gaa ggc tct gag gca agc cat gac aca tgt gta gat att gat gaa	16534
Glu Gly Ser Glu Ala Ser His Asp Thr Cys Val Asp Ile Asp Glu	
5425 5430 5435	
tgt gaa aat aca gat gcc tgc cag cat gag tgt aag aat acc ttt	16579
Cys Glu Asn Thr Asp Ala Cys Gln His Glu Cys Lys Asn Thr Phe	
5440 5445 5450	
gga agt tat cag tgc atc tgc cca cct ggc tat caa ctc aca cac	16624
Gly Ser Tyr Gln Cys Ile Cys Pro Pro Gly Tyr Gln Leu Thr His	
5455 5460 5465	
aat gga aag aca tgc caa gat atc gat gaa tgt ctg gag cag aat	16669
Asn Gly Lys Thr Cys Gln Asp Ile Asp Glu Cys Leu Glu Gln Asn	
5470 5475 5480	
gtg cac tgt gga ccc aat cgc atg tgc ttc aac atg aga gga agc	16714
Val His Cys Gly Pro Asn Arg Met Cys Phe Asn Met Arg Gly Ser	
5485 5490 5495	

tac cag tgc atc gat	aca ccc tgt cca ccc	aac tac caa cgg gat	16759
Tyr Gln Cys Ile Asp	Thr Pro Cys Pro Pro	Asn Tyr Gln Arg Asp	
5500	5505	5510	
cct gtt tca ggg ttc	tgc ctc aag aac tgt	cca ccc aat gat ttg	16804
Pro Val Ser Gly Phe	Cys Leu Lys Asn Cys	Pro Pro Asn Asp Leu	
5515	5520	5525	
gaa tgt gcc ttg agc	cca tat gcc ttg gaa	tac aaa ctc gtc tcc	16849
Glu Cys Ala Leu Ser	Pro Tyr Ala Leu Glu	Tyr Lys Leu Val Ser	
5530	5535	5540	
ctc cca ttt gga ata	gcc acc aat caa gat	tta atc cgg ctg gtt	16894
Leu Pro Phe Gly Ile	Ala Thr Asn Gln Asp	Leu Ile Arg Leu Val	
5545	5550	5555	
gca tac aca cag gat	gga gtg atg cat ccc	agg aca act ttc ctc	16939
Ala Tyr Thr Gln Asp	Gly Val Met His Pro	Arg Thr Thr Phe Leu	
5560	5565	5570	
atg gta gat gag gaa	cag act gtt cct ttt	gcc ttg agg gat gaa	16984
Met Val Asp Glu Glu	Gln Thr Val Pro Phe	Ala Leu Arg Asp Glu	
5575	5580	5585	
aac ctg aaa gga gtg	gtg tat aca aca cga	cca cta cga gaa gca	17029
Asn Leu Lys Gly Val	Val Tyr Thr Thr Arg	Pro Leu Arg Glu Ala	
5590	5595	5600	
gag acc tac cgc atg	agg gtc cga gcc tca	tcc tac agt gcc aat	17074
Glu Thr Tyr Arg Met	Arg Val Arg Ala Ser	Ser Tyr Ser Ala Asn	
5605	5610	5615	
ggg acc att gaa tat	cag acc aca ttc ata	gtt tat ata gct gtg	17119
Gly Thr Ile Glu Tyr	Gln Thr Thr Phe Ile	Val Tyr Ile Ala Val	
5620	5625	5630	
tcc gcc tat cca tac	taa ggaactctcc aaagcctatt	ccacatatatt	17167
Ser Ala Tyr Pro Tyr			
5635			
aaaccgcatt aatcatggca	atcaagcccc cttccagatt	actgtctctt gaacagttgc	17227
aatcttggca gcttgaaaat	ggtgctacac tctgttttgt	gtgccttctt tgggtacttct	17287
gaggtatttt catgatccca	ccatgggtcat atcttgaagt	atgggtctaga aaagtccctt	17347
attatttttat ttattacact	ggagcagtta cttcccaaag	attattctga acatctaaca	17407
ggacatatca gtgatggttt	acagtagtgt agtacctaag	atcattttcc tgaaagccaa	17467
accaaacaac gaaaaacaag	aacaactaat tcagaatcaa	atagagtttt tgagcatttg	17527
actattttta gaatcataaa	attagttact aagtattttg	atcaaagctt ataaaataac	17587
ttacggagat ttttgtaagt	attgatacat tataatagga	cttgcctatt ttcattttta	17647
agaagaaaaa caccactcat	tttataaaat atagtacagc	tactataagg cttgtttgat	17707

49321-59.ST25.txt

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cccaaattggt gcttatcttg attgaacatt cagaacaagg atattatattt cagtgatttt 17767
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atttttatga agtgtatata tattacctta gtgtgcattt tctatataat atcttgatgg 18127
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tttcacaact ttttttcat 18206

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<211> 5635

<212> PRT

<213> Homo sapiens

<400> 2

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Met Ile Ser Trp Glu Val Val His Thr Val Phe Leu Phe Ala Leu Leu
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```

```

Tyr Ser Ser Leu Ala Gln Asp Ala Ser Pro Gln Ser Glu Ile Arg Ala
20           25           30

```

```

Glu Glu Ile Pro Glu Gly Ala Ser Thr Leu Ala Phe Val Phe Asp Val
35           40           45

```

```

Thr Gly Ser Met Tyr Asp Asp Leu Val Gln Val Ile Glu Gly Ala Ser
50           55           60

```

```

Lys Ile Leu Glu Thr Ser Leu Lys Arg Pro Lys Arg Pro Leu Phe Asn
65           70           75           80

```

```

Phe Ala Leu Val Pro Phe His Asp Pro Glu Ile Gly Pro Val Thr Ile
85           90           95

```

```

Thr Thr Asp Pro Lys Lys Phe Gln Tyr Glu Leu Arg Glu Leu Tyr Val
100          105          110

```

Gln Gly Gly Gly Asp Cys Pro Glu Met Ser Ile Gly Ala Ile Lys Ile
 115 120 125

Ala Leu Glu Ile Ser Leu Pro Gly Ser Phe Ile Tyr Val Phe Thr Asp
 130 135 140

Ala Arg Ser Lys Asp Tyr Arg Leu Thr His Glu Val Leu Gln Leu Ile
 145 150 155 160

Gln Gln Lys Gln Ser Gln Val Val Phe Val Leu Thr Gly Asp Cys Asp
 165 170 175

Asp Arg Thr His Ile Gly Tyr Lys Val Tyr Glu Glu Ile Ala Ser Thr
 180 185 190

Ser Ser Gly Gln Val Phe His Leu Asp Lys Lys Gln Val Asn Glu Val
 195 200 205

Leu Lys Trp Val Glu Glu Ala Val Gln Ala Ser Lys Val His Leu Leu
 210 215 220

Ser Thr Asp His Leu Glu Gln Ala Val Asn Thr Trp Arg Ile Pro Phe
 225 230 235 240

Asp Pro Ser Leu Lys Glu Val Thr Val Ser Leu Ser Gly Pro Ser Pro
 245 250 255

Met Ile Glu Ile Arg Asn Pro Leu Gly Lys Leu Ile Lys Lys Gly Phe
 260 265 270

Gly Leu His Glu Leu Leu Asn Ile His Asn Ser Ala Lys Val Val Asn
 275 280 285

Val Lys Glu Pro Glu Ala Gly Met Trp Thr Val Lys Thr Ser Ser Ser
 290 295 300

Gly Arg His Ser Val Arg Ile Thr Gly Leu Ser Thr Ile Asp Phe Arg
 305 310 315 320

Ala Gly Phe Ser Arg Lys Pro Thr Leu Asp Phe Lys Lys Thr Val Ser
 325 330 335

Arg Pro Val Gln Gly Ile Pro Thr Tyr Val Leu Leu Asn Thr Ser Gly
 340 345 350

Ile Ser Thr Pro Ala Arg Ile Asp Leu Leu Glu Leu Leu Ser Ile Ser
 355 360 365

Gly Ser Ser Leu Lys Thr Ile Pro Val Lys Tyr Tyr Pro His Arg Lys
 370 375 380

Pro Tyr Gly Ile Trp Asn Ile Ser Asp Phe Val Pro Pro Asn Glu Ala
 385 390 395 400

Phe Phe Leu Lys Val Thr Gly Tyr Asp Lys Asp Asp Tyr Leu Phe Gln
 405 410 415

Arg Val Ser Ser Val Ser Phe Ser Ser Ile Val Pro Asp Ala Pro Lys
 420 425 430

Val Thr Met Pro Glu Lys Thr Pro Gly Tyr Tyr Leu Gln Pro Gly Gln
 435 440 445

Ile Pro Cys Ser Val Asp Ser Leu Leu Pro Phe Thr Leu Ser Phe Val
 450 455 460

Arg Asn Gly Val Thr Leu Gly Val Asp Gln Tyr Leu Lys Glu Ser Ala
 465 470 475 480

Ser Val Asn Leu Asp Ile Ala Lys Val Thr Leu Ser Asp Glu Gly Phe
 485 490 495

Tyr Glu Cys Ile Ala Val Ser Ser Ala Gly Thr Gly Arg Ala Gln Thr
 500 505 510

Phe Phe Asp Val Ser Glu Pro Pro Pro Val Ile Gln Val Pro Asn Asn
 515 520 525

Val Thr Val Thr Pro Gly Glu Arg Ala Val Leu Thr Cys Leu Ile Ile
 530 535 540

Ser Ala Val Asp Tyr Asn Leu Thr Trp Gln Arg Asn Asp Arg Asp Val
 545 550 555 560

Arg Leu Ala Glu Pro Ala Arg Ile Arg Thr Leu Ala Asn Leu Ser Leu
 565 570 575

Glu Leu Lys Ser Val Lys Phe Asn Asp Ala Gly Glu Tyr His Cys Met
 580 585 590

Val Ser Ser Glu Gly Gly Ser Ser Ala Ala Ser Val Phe Leu Thr Val
595 600 605

Gln Glu Pro Pro Lys Val Thr Val Met Pro Lys Asn Gln Ser Phe Thr
610 615 620

Gly Gly Ser Glu Val Ser Ile Met Cys Ser Ala Thr Gly Tyr Pro Lys
625 630 635 640

Pro Lys Ile Ala Trp Thr Val Asn Asp Met Phe Ile Val Gly Ser His
645 650 655

Arg Tyr Arg Met Thr Ser Asp Gly Thr Leu Phe Ile Lys Asn Ala Ala
660 665 670

Pro Lys Asp Ala Gly Ile Tyr Gly Cys Leu Ala Ser Asn Ser Ala Gly
675 680 685

Thr Asp Lys Gln Asn Ser Thr Leu Arg Tyr Ile Glu Ala Pro Lys Leu
690 695 700

Met Val Val Gln Ser Glu Leu Leu Val Ala Leu Gly Asp Ile Thr Val
705 710 715 720

Met Glu Cys Lys Thr Ser Gly Ile Pro Pro Pro Gln Val Lys Trp Phe
725 730 735

Lys Gly Asp Leu Glu Leu Arg Pro Ser Thr Phe Leu Ile Ile Asp Pro
740 745 750

Leu Leu Gly Leu Leu Lys Ile Gln Glu Thr Gln Asp Leu Asp Ala Gly
755 760 765

Asp Tyr Thr Cys Val Ala Ile Asn Glu Ala Gly Arg Ala Thr Gly Lys
770 775 780

Ile Thr Leu Asp Val Gly Ser Pro Pro Val Phe Ile Gln Glu Pro Ala
785 790 795 800

Asp Val Ser Met Glu Ile Gly Ser Asn Val Thr Leu Pro Cys Tyr Val
805 810 815

Gln Gly Tyr Pro Glu Pro Thr Ile Lys Trp Arg Arg Leu Asp Asn Met

820

825

830

Pro Ile Phe Ser Arg Pro Phe Ser Val Ser Ser Ile Ser Gln Leu Arg
 835 840 845

Thr Gly Ala Leu Phe Ile Leu Asn Leu Trp Ala Ser Asp Lys Gly Thr
 850 855 860

Tyr Ile Cys Glu Ala Glu Asn Gln Phe Gly Lys Ile Gln Ser Glu Thr
 865 870 875 880

Thr Val Thr Val Thr Gly Leu Val Ala Pro Leu Ile Gly Ile Ser Pro
 885 890 895

Ser Val Ala Asn Val Ile Glu Gly Gln Gln Leu Thr Leu Pro Cys Thr
 900 905 910

Leu Leu Ala Gly Asn Pro Ile Pro Glu Arg Arg Trp Ile Lys Asn Ser
 915 920 925

Ala Met Leu Leu Gln Asn Pro Tyr Ile Thr Val Arg Ser Asp Gly Ser
 930 935 940

Leu His Ile Glu Arg Val Gln Leu Gln Asp Gly Gly Glu Tyr Thr Cys
 945 950 955 960

Val Ala Ser Asn Val Ala Gly Thr Asn Asn Lys Thr Thr Ser Val Val
 965 970 975

Val His Val Leu Pro Thr Ile Gln His Gly Gln Gln Ile Leu Ser Thr
 980 985 990

Ile Glu Gly Ile Pro Val Thr Leu Pro Cys Lys Ala Ser Gly Asn Pro
 995 1000 1005

Lys Pro Ser Val Ile Trp Ser Lys Lys Gly Glu Leu Ile Ser Thr
 1010 1015 1020

Ser Ser Ala Lys Phe Ser Ala Gly Ala Asp Gly Ser Leu Tyr Val
 1025 1030 1035

Val Ser Pro Gly Gly Glu Glu Ser Gly Glu Tyr Val Cys Thr Ala
 1040 1045 1050

49321-59.ST25.txt

Thr Asn Thr Ala Gly Tyr Ala Lys Arg Lys Val Gln Leu Thr Val
 1055 1060 1065

 Tyr Val Arg Pro Arg Val Phe Gly Asp Gln Arg Gly Leu Ser Gln
 1070 1075 1080

 Asp Lys Pro Val Glu Ile Ser Val Leu Ala Gly Glu Glu Val Thr
 1085 1090 1095

 Leu Pro Cys Glu Val Lys Ser Leu Pro Pro Pro Ile Ile Thr Trp
 1100 1105 1110

 Ala Lys Glu Thr Gln Leu Ile Ser Pro Phe Ser Pro Arg His Thr
 1115 1120 1125

 Phe Leu Pro Ser Gly Ser Met Lys Ile Thr Glu Thr Arg Thr Ser
 1130 1135 1140

 Asp Ser Gly Met Tyr Leu Cys Val Ala Thr Asn Ile Ala Gly Asn
 1145 1150 1155

 Val Thr Gln Ala Val Lys Leu Asn Val His Val Pro Pro Lys Ile
 1160 1165 1170

 Gln Arg Gly Pro Lys His Leu Lys Val Gln Val Gly Gln Arg Val
 1175 1180 1185

 Asp Ile Pro Cys Asn Ala Gln Gly Thr Pro Leu Pro Val Ile Thr
 1190 1195 1200

 Trp Ser Lys Gly Gly Ser Thr Met Leu Val Asp Gly Glu His His
 1205 1210 1215

 Val Ser Asn Pro Asp Gly Thr Leu Ser Ile Asp Gln Ala Thr Pro
 1220 1225 1230

 Ser Asp Ala Gly Ile Tyr Thr Cys Val Ala Thr Asn Ile Ala Gly
 1235 1240 1245

 Thr Asp Glu Thr Glu Ile Thr Leu His Val Gln Glu Pro Pro Thr
 1250 1255 1260

 Val Glu Asp Leu Glu Pro Pro Tyr Asn Thr Thr Phe Gln Glu Arg
 1265 1270 1275

Val	Ala	Asn	Gln	Arg	Ile	Glu	Phe	Pro	Cys	Pro	Ala	Lys	Gly	Thr
1280						1285					1290			
Pro	Lys	Pro	Thr	Ile	Lys	Trp	Leu	His	Asn	Gly	Arg	Glu	Leu	Thr
1295						1300					1305			
Gly	Arg	Glu	Pro	Gly	Ile	Ser	Ile	Leu	Glu	Asp	Gly	Thr	Leu	Leu
1310						1315					1320			
Val	Ile	Ala	Ser	Val	Thr	Pro	Tyr	Asp	Asn	Gly	Glu	Tyr	Ile	Cys
1325						1330					1335			
Val	Ala	Val	Asn	Glu	Ala	Gly	Thr	Thr	Glu	Arg	Lys	Tyr	Asn	Leu
1340						1345					1350			
Lys	Val	His	Val	Pro	Pro	Val	Ile	Lys	Asp	Lys	Glu	Gln	Val	Thr
1355						1360					1365			
Asn	Val	Ser	Val	Leu	Leu	Asn	Gln	Leu	Thr	Asn	Leu	Phe	Cys	Glu
1370						1375					1380			
Val	Glu	Gly	Thr	Pro	Ser	Pro	Ile	Ile	Met	Trp	Tyr	Lys	Asp	Asn
1385						1390					1395			
Val	Gln	Val	Thr	Glu	Ser	Ser	Thr	Ile	Gln	Thr	Val	Asn	Asn	Gly
1400						1405					1410			
Lys	Ile	Leu	Lys	Leu	Phe	Arg	Ala	Thr	Pro	Glu	Asp	Ala	Gly	Arg
1415						1420					1425			
Tyr	Ser	Cys	Lys	Ala	Ile	Asn	Ile	Ala	Gly	Thr	Ser	Gln	Lys	Tyr
1430						1435					1440			
Phe	Asn	Ile	Asp	Val	Leu	Val	Pro	Pro	Thr	Ile	Ile	Gly	Thr	Asn
1445						1450					1455			
Phe	Pro	Asn	Glu	Val	Ser	Val	Val	Leu	Asn	Arg	Asp	Val	Ala	Leu
1460						1465					1470			
Glu	Cys	Gln	Val	Lys	Gly	Thr	Pro	Phe	Pro	Asp	Ile	His	Trp	Phe
1475						1480					1485			
Lys	Asp	Gly	Lys	Pro	Leu	Phe	Leu	Gly	Asp	Pro	Asn	Val	Glu	Leu
1490						1495					1500			

Leu Asp Arg Gly Gln Val Leu His Leu Lys Asn Ala Arg Arg Asn
1505 1510 1515

Asp Lys Gly Arg Tyr Gln Cys Thr Val Ser Asn Ala Ala Gly Lys
1520 1525 1530

Gln Ala Lys Asp Ile Lys Leu Thr Ile Tyr Asn Pro Pro Ser Ile
1535 1540 1545

Lys Gly Gly Asn Val Thr Thr Asp Ile Ser Val Leu Ile Asn Ser
1550 1555 1560

Leu Ile Lys Leu Glu Cys Glu Thr Arg Gly Leu Pro Met Pro Ala
1565 1570 1575

Ile Thr Trp Tyr Lys Asp Gly Gln Pro Ile Met Ser Ser Ser Gln
1580 1585 1590

Ala Leu Tyr Ile Asp Lys Gly Gln Tyr Leu His Ile Pro Arg Ala
1595 1600 1605

Gln Val Ser Asp Ser Ala Thr Tyr Thr Cys His Val Ala Asn Val
1610 1615 1620

Ala Gly Thr Ala Glu Lys Ser Phe His Val Asp Val Tyr Val Pro
1625 1630 1635

Pro Met Ile Glu Gly Asn Leu Ala Thr Pro Leu Asn Lys Gln Val
1640 1645 1650

Val Ile Ala His Ser Leu Thr Leu Glu Cys Lys Ala Ala Gly Asn
1655 1660 1665

Pro Ser Pro Ile Leu Thr Trp Leu Lys Asp Gly Val Pro Val Lys
1670 1675 1680

Ala Asn Asp Asn Ile Arg Ile Glu Ala Gly Gly Lys Lys Leu Glu
1685 1690 1695

Ile Met Ser Ala Gln Glu Ile Asp Arg Gly Gln Tyr Ile Cys Val
1700 1705 1710

Ala Thr Ser Val Ala Gly Glu Lys Glu Ile Lys Tyr Glu Val Asp

1715		1720		1725	
Val Leu	Val Pro Pro Ala	Ile Glu Gly Gly Asp Glu	Thr Ser Tyr		
1730		1735		1740	
Phe Ile	Val Met Val Asn Asn	Leu Leu Glu Leu Asp	Cys His Val		
1745		1750		1755	
Thr Gly	Ser Pro Pro Pro	Thr Ile Met Trp Leu Lys	Asp Gly Gln		
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Leu Ile	Asp Glu Arg Asp Gly	Phe Lys Ile Leu Leu	Asn Gly Arg		
1775		1780		1785	
Lys Leu	Val Ile Ala Gln Ala	Gln Val Ser Asn Thr	Gly Leu Tyr		
1790		1795		1800	
Arg Cys	Met Ala Ala Asn Thr	Ala Gly Asp His Lys	Lys Glu Phe		
1805		1810		1815	
Glu Val	Thr Val His Val Pro	Pro Thr Ile Lys Ser	Ser Gly Leu		
1820		1825		1830	
Ser Glu	Arg Val Val Val Lys	Tyr Lys Pro Val Ala	Leu Gln Cys		
1835		1840		1845	
Ile Ala	Asn Gly Ile Pro Asn	Pro Ser Ile Thr Trp	Leu Lys Asp		
1850		1855		1860	
Asp Gln	Pro Val Asn Thr Ala	Gln Gly Asn Leu Lys	Ile Gln Ser		
1865		1870		1875	
Ser Gly	Arg Val Leu Gln Ile	Ala Lys Thr Leu Leu	Glu Asp Ala		
1880		1885		1890	
Gly Arg	Tyr Thr Cys Val Ala	Thr Asn Ala Ala Gly	Glu Thr Gln		
1895		1900		1905	
Gln His	Ile Gln Leu His Val	His Glu Pro Pro Ser	Leu Glu Asp		
1910		1915		1920	
Ala Gly	Lys Met Leu Asn Glu	Thr Val Leu Val Ser	Asn Pro Val		
1925		1930		1935	

Gln Leu Glu Cys Lys Ala Ala Gly Asn Pro Val Pro Val Ile Thr
 1940 1945 1950

Trp Tyr Lys Asp Asn Arg Leu Leu Ser Gly Ser Thr Ser Met Thr
 1955 1960 1965

Phe Leu Asn Arg Gly Gln Ile Ile Asp Ile Glu Ser Ala Gln Ile
 1970 1975 1980

Ser Asp Ala Gly Ile Tyr Lys Cys Val Ala Ile Asn Ser Ala Gly
 1985 1990 1995

Ala Thr Glu Leu Phe Tyr Ser Leu Gln Val His Val Ala Pro Ser
 2000 2005 2010

Ile Ser Gly Ser Asn Asn Met Val Ala Val Val Val Asn Asn Pro
 2015 2020 2025

Val Arg Leu Glu Cys Glu Ala Arg Gly Ile Pro Ala Pro Ser Leu
 2030 2035 2040

Thr Trp Leu Lys Asp Gly Ser Pro Val Ser Ser Phe Ser Asn Gly
 2045 2050 2055

Leu Gln Val Leu Ser Gly Gly Arg Ile Leu Ala Leu Thr Ser Ala
 2060 2065 2070

Gln Ile Ser Asp Thr Gly Arg Tyr Thr Cys Val Ala Val Asn Ala
 2075 2080 2085

Ala Gly Glu Lys Gln Arg Asp Ile Asp Leu Arg Val Tyr Val Pro
 2090 2095 2100

Pro Asn Ile Met Gly Glu Glu Gln Asn Val Ser Val Leu Ile Ser
 2105 2110 2115

Gln Ala Val Glu Leu Leu Cys Gln Ser Asp Ala Ile Pro Pro Pro
 2120 2125 2130

Thr Leu Thr Trp Leu Lys Asp Gly His Pro Leu Leu Lys Lys Pro
 2135 2140 2145

Gly Leu Ser Ile Ser Glu Asn Arg Ser Val Leu Lys Ile Glu Asp
 2150 2155 2160

Ala Gln Val Gln Asp Thr Gly Arg Tyr Thr Cys Glu Ala Thr Asn
2165 2170 2175

Val Ala Gly Lys Thr Glu Lys Asn Tyr Asn Val Asn Ile Trp Val
2180 2185 2190

Pro Pro Asn Ile Gly Gly Ser Asp Glu Leu Thr Gln Leu Thr Val
2195 2200 2205

Ile Glu Gly Asn Leu Ile Ser Leu Leu Cys Glu Ser Ser Gly Ile
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Pro Pro Pro Asn Leu Ile Trp Lys Lys Lys Gly Ser Pro Val Leu
2225 2230 2235

Thr Asp Ser Met Gly Arg Val Arg Ile Leu Ser Gly Gly Arg Gln
2240 2245 2250

Leu Gln Ile Ser Ile Ala Glu Lys Ser Asp Ala Ala Leu Tyr Ser
2255 2260 2265

Cys Val Ala Ser Asn Val Ala Gly Thr Ala Lys Lys Glu Tyr Asn
2270 2275 2280

Leu Gln Val Tyr Ile Arg Pro Thr Ile Thr Asn Ser Gly Ser His
2285 2290 2295

Pro Thr Glu Ile Ile Val Thr Arg Gly Lys Ser Ile Ser Leu Glu
2300 2305 2310

Cys Glu Val Gln Gly Ile Pro Pro Pro Thr Val Thr Trp Met Lys
2315 2320 2325

Asp Gly His Pro Leu Ile Lys Ala Lys Gly Val Glu Ile Leu Asp
2330 2335 2340

Glu Gly His Ile Leu Gln Leu Lys Asn Ile His Val Ser Asp Thr
2345 2350 2355

Gly Arg Tyr Val Cys Val Ala Val Asn Val Ala Gly Met Thr Asp
2360 2365 2370

Lys Lys Tyr Asp Leu Ser Val His Ala Pro Pro Ser Ile Ile Gly
2375 2380 2385

Asn His Arg Ser Pro Glu Asn Ile Ser Val Val Glu Lys Asn Ser
2390 2395 2400

Val Ser Leu Thr Cys Glu Ala Ser Gly Ile Pro Leu Pro Ser Ile
2405 2410 2415

Thr Trp Phe Lys Asp Gly Trp Pro Val Ser Leu Ser Asn Ser Val
2420 2425 2430

Arg Ile Leu Ser Gly Gly Arg Met Leu Arg Leu Met Gln Thr Thr
2435 2440 2445

Met Glu Asp Ala Gly Gln Tyr Thr Cys Val Val Arg Asn Ala Ala
2450 2455 2460

Gly Glu Glu Arg Lys Ile Phe Gly Leu Ser Val Leu Val Pro Pro
2465 2470 2475

His Ile Val Gly Glu Asn Thr Leu Glu Asp Val Lys Val Lys Glu
2480 2485 2490

Lys Gln Ser Val Thr Leu Thr Cys Glu Val Thr Gly Asn Pro Val
2495 2500 2505

Pro Glu Ile Thr Trp His Lys Asp Gly Gln Pro Leu Gln Glu Asp
2510 2515 2520

Glu Ala His His Ile Ile Ser Gly Gly Arg Phe Leu Gln Ile Thr
2525 2530 2535

Asn Val Gln Val Pro His Thr Gly Arg Tyr Thr Cys Leu Ala Ser
2540 2545 2550

Ser Pro Ala Gly His Lys Ser Arg Ser Phe Ser Leu Asn Val Phe
2555 2560 2565

Val Ser Pro Thr Ile Ala Gly Val Gly Ser Asp Gly Asn Pro Glu
2570 2575 2580

Asp Val Thr Val Ile Leu Asn Ser Pro Thr Ser Leu Val Cys Glu
2585 2590 2595

Ala Tyr Ser Tyr Pro Pro Ala Thr Ile Thr Trp Phe Lys Asp Gly

2600		2605		2610
Thr Pro	Leu Glu Ser Asn Arg	Asn Ile Arg Ile	Leu Pro Gly Gly	
2615		2620	2625	
Arg Thr	Leu Gln Ile Leu Asn	Ala Gln Glu Asp	Asn Ala Gly Arg	
2630		2635	2640	
Tyr Ser	Cys Val Ala Thr Asn	Glu Ala Gly Glu	Met Ile Lys His	
2645		2650	2655	
Tyr Glu	Val Lys Val Tyr Ile	Pro Pro Ile Ile	Asn Lys Gly Asp	
2660		2665	2670	
Leu Trp	Gly Pro Gly Leu Ser	Pro Lys Glu Val	Lys Ile Lys Val	
2675		2680	2685	
Asn Asn	Thr Leu Thr Leu Glu	Cys Glu Ala Tyr	Ala Ile Pro Ser	
2690		2695	2700	
Ala Ser	Leu Ser Trp Tyr Lys	Asp Gly Gln Pro	Leu Lys Ser Asp	
2705		2710	2715	
Asp His	Val Asn Ile Ala Ala	Asn Gly His Thr	Leu Gln Ile Lys	
2720		2725	2730	
Glu Ala	Gln Ile Ser Asp Thr	Gly Arg Tyr Thr	Cys Val Ala Ser	
2735		2740	2745	
Asn Ile	Ala Gly Glu Asp Glu	Leu Asp Phe Asp	Val Asn Ile Gln	
2750		2755	2760	
Val Pro	Pro Ser Phe Gln Lys	Leu Trp Glu Ile	Gly Asn Met Leu	
2765		2770	2775	
Asp Thr	Gly Arg Asn Gly Glu	Ala Lys Asp Val	Ile Ile Asn Asn	
2780		2785	2790	
Pro Ile	Ser Leu Tyr Cys Glu	Thr Asn Ala Ala	Pro Pro Pro Thr	
2795		2800	2805	
Leu Thr	Trp Tyr Lys Asp Gly	His Pro Leu Thr	Ser Ser Asp Lys	
2810		2815	2820	

Val Leu Ile Leu Pro Gly Gly Arg Val Leu Gln Ile Pro Arg Ala
 2825 2830 2835

Lys Val Glu Asp Ala Gly Arg Tyr Thr Cys Val Ala Val Asn Glu
 2840 2845 2850

Ala Gly Glu Asp Ser Leu Gln Tyr Asp Val Arg Val Leu Val Pro
 2855 2860 2865

Pro Ile Ile Lys Gly Ala Asn Ser Asp Leu Pro Glu Glu Val Thr
 2870 2875 2880

Val Leu Val Asn Lys Ser Ala Leu Ile Glu Cys Leu Ser Ser Gly
 2885 2890 2895

Ser Pro Ala Pro Arg Asn Ser Trp Gln Lys Asp Gly Gln Pro Leu
 2900 2905 2910

Leu Glu Asp Asp His His Lys Phe Leu Ser Asn Gly Arg Ile Leu
 2915 2920 2925

Gln Ile Leu Asn Thr Gln Ile Thr Asp Ile Gly Arg Tyr Val Cys
 2930 2935 2940

Val Ala Glu Asn Thr Ala Gly Ser Ala Lys Lys Tyr Phe Asn Leu
 2945 2950 2955

Asn Val His Val Pro Pro Ser Val Ile Gly Pro Lys Ser Glu Asn
 2960 2965 2970

Leu Thr Val Val Val Asn Asn Phe Ile Ser Leu Thr Cys Glu Val
 2975 2980 2985

Ser Gly Phe Pro Pro Pro Asp Leu Ser Trp Leu Lys Asn Glu Gln
 2990 2995 3000

Pro Ile Lys Leu Asn Thr Asn Thr Leu Ile Val Pro Gly Gly Arg
 3005 3010 3015

Thr Leu Gln Ile Ile Arg Ala Lys Val Ser Asp Gly Gly Glu Tyr
 3020 3025 3030

Thr Cys Ile Ala Ile Asn Gln Ala Gly Glu Ser Lys Lys Lys Phe
 3035 3040 3045

Ser Leu Thr Val Tyr Val Pro Pro Ser Ile Lys Asp His Asp Ser
 3050 3055 3060
 Glu Ser Leu Ser Val Val Asn Val Arg Glu Gly Thr Ser Val Ser
 3065 3070 3075
 Leu Glu Cys Glu Ser Asn Ala Val Pro Pro Pro Val Ile Thr Trp
 3080 3085 3090
 Tyr Lys Asn Gly Arg Met Ile Thr Glu Ser Thr His Val Glu Ile
 3095 3100 3105
 Leu Ala Asp Gly Gln Met Leu His Ile Lys Lys Ala Glu Val Ser
 3110 3115 3120
 Asp Thr Gly Gln Tyr Val Cys Arg Ala Ile Asn Val Ala Gly Arg
 3125 3130 3135
 Asp Asp Lys Asn Phe His Leu Asn Val Tyr Val Pro Pro Ser Ile
 3140 3145 3150
 Glu Gly Pro Glu Arg Glu Val Ile Val Glu Thr Ile Ser Asn Pro
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 Val Thr Leu Thr Cys Asp Ala Thr Gly Ile Pro Pro Pro Thr Ile
 3170 3175 3180
 Ala Trp Leu Lys Asn His Lys Arg Ile Glu Asn Ser Asp Ser Leu
 3185 3190 3195
 Glu Val Arg Ile Leu Ser Gly Gly Ser Lys Leu Gln Ile Ala Arg
 3200 3205 3210
 Ser Gln His Ser Asp Ser Gly Asn Tyr Thr Cys Ile Ala Ser Asn
 3215 3220 3225
 Met Glu Gly Lys Ala Gln Lys Tyr Tyr Phe Leu Ser Ile Gln Val
 3230 3235 3240
 Pro Pro Ser Val Ala Gly Ala Glu Ile Pro Ser Asp Val Ser Val
 3245 3250 3255
 Leu Leu Gly Glu Asn Val Glu Leu Val Cys Asn Ala Asn Gly Ile
 3260 3265 3270

Pro Thr Pro Leu Ile Gln Trp Leu Lys Asp Gly Lys Pro Ile Ala
 3275 3280 3285

 Ser Gly Glu Thr Glu Arg Ile Arg Val Ser Ala Asn Gly Ser Thr
 3290 3295 3300

 Leu Asn Ile Tyr Gly Ala Leu Thr Ser Asp Thr Gly Lys Tyr Thr
 3305 3310 3315

 Cys Val Ala Thr Asn Pro Ala Gly Glu Glu Asp Arg Ile Phe Asn
 3320 3325 3330

 Leu Asn Val Tyr Val Thr Pro Thr Ile Arg Gly Asn Lys Asp Glu
 3335 3340 3345

 Ala Glu Lys Leu Met Thr Leu Val Asp Thr Ser Ile Asn Ile Glu
 3350 3355 3360

 Cys Arg Ala Thr Gly Thr Pro Pro Pro Gln Ile Asn Trp Leu Lys
 3365 3370 3375

 Asn Gly Leu Pro Leu Pro Leu Ser Ser His Ile Arg Leu Leu Ala
 3380 3385 3390

 Ala Gly Gln Val Ile Arg Ile Val Arg Ala Gln Val Ser Asp Val
 3395 3400 3405

 Ala Val Tyr Thr Cys Val Ala Ser Asn Arg Ala Gly Val Asp Asn
 3410 3415 3420

 Lys His Tyr Asn Leu Gln Val Phe Ala Pro Pro Asn Met Asp Asn
 3425 3430 3435

 Ser Met Gly Thr Glu Glu Ile Thr Val Leu Lys Gly Ser Ser Thr
 3440 3445 3450

 Ser Met Ala Cys Ile Thr Asp Gly Thr Pro Ala Pro Ser Met Ala
 3455 3460 3465

 Trp Leu Arg Asp Gly Gln Pro Leu Gly Leu Asp Ala His Leu Thr
 3470 3475 3480

 Val Ser Thr His Gly Met Val Leu Gln Leu Leu Lys Ala Glu Thr

3485		3490		3495
Glu Asp Ser Gly Lys Tyr Thr Cys Ile Ala Ser Asn Glu Ala Gly	3500	3505	3510	
Glu Val Ser Lys His Phe Ile Leu Lys Val Leu Glu Pro Pro His	3515	3520	3525	
Ile Asn Gly Ser Glu Glu His Glu Glu Ile Ser Val Ile Val Asn	3530	3535	3540	
Asn Pro Leu Glu Leu Thr Cys Ile Ala Ser Gly Ile Pro Ala Pro	3545	3550	3555	
Lys Met Thr Trp Met Lys Asp Gly Arg Pro Leu Pro Gln Thr Asp	3560	3565	3570	
Gln Val Gln Thr Leu Gly Gly Gly Glu Val Leu Arg Ile Ser Thr	3575	3580	3585	
Ala Gln Val Glu Asp Thr Gly Arg Tyr Thr Cys Leu Ala Ser Ser	3590	3595	3600	
Pro Ala Gly Asp Asp Asp Lys Glu Tyr Leu Val Arg Val His Val	3605	3610	3615	
Pro Pro Asn Ile Ala Gly Thr Asp Glu Pro Arg Asp Ile Thr Val	3620	3625	3630	
Leu Arg Asn Arg Gln Val Thr Leu Glu Cys Lys Ser Asp Ala Val	3635	3640	3645	
Pro Pro Pro Val Ile Thr Trp Leu Arg Asn Gly Glu Arg Leu Gln	3650	3655	3660	
Ala Thr Pro Arg Val Arg Ile Leu Ser Gly Gly Arg Tyr Leu Gln	3665	3670	3675	
Ile Asn Asn Ala Asp Leu Gly Asp Thr Ala Asn Tyr Thr Cys Val	3680	3685	3690	
Ala Ser Asn Ile Ala Gly Lys Thr Thr Arg Glu Phe Ile Leu Thr	3695	3700	3705	

Val Asn Val Pro Pro Asn Ile Lys Gly Gly Pro Gln Ser Leu Val
 3710 3715 3720

Ile Leu Leu Asn Lys Ser Thr Val Leu Glu Cys Ile Ala Glu Gly
 3725 3730 3735

Val Pro Thr Pro Arg Ile Thr Trp Arg Lys Asp Gly Ala Val Leu
 3740 3745 3750

Ala Gly Asn His Ala Arg Tyr Ser Ile Leu Glu Asn Gly Phe Leu
 3755 3760 3765

His Ile Gln Ser Ala His Val Thr Asp Thr Gly Arg Tyr Leu Cys
 3770 3775 3780

Met Ala Thr Asn Ala Ala Gly Thr Asp Arg Arg Arg Ile Asp Leu
 3785 3790 3795

Gln Val His Val Pro Pro Ser Ile Ala Pro Gly Pro Thr Asn Met
 3800 3805 3810

Thr Val Ile Val Asn Val Gln Thr Thr Leu Ala Cys Glu Ala Thr
 3815 3820 3825

Gly Ile Pro Lys Pro Ser Ile Asn Trp Arg Lys Asn Gly His Leu
 3830 3835 3840

Leu Asn Val Asp Gln Asn Gln Asn Ser Tyr Arg Leu Leu Ser Ser
 3845 3850 3855

Gly Ser Leu Val Ile Ile Ser Pro Ser Val Asp Asp Thr Ala Thr
 3860 3865 3870

Tyr Glu Cys Thr Val Thr Asn Gly Ala Gly Asp Asp Lys Arg Thr
 3875 3880 3885

Val Asp Leu Thr Val Gln Val Pro Pro Ser Ile Ala Asp Glu Pro
 3890 3895 3900

Thr Asp Phe Leu Val Thr Lys His Ala Pro Ala Val Ile Thr Cys
 3905 3910 3915

Thr Ala Ser Gly Val Pro Phe Pro Ser Ile His Trp Thr Lys Asn
 3920 3925 3930

Gly Ile Arg Leu Leu Pro Arg Gly Asp Gly Tyr Arg Ile Leu Ser
 3935 3940 3945

 Ser Gly Ala Ile Glu Ile Leu Ala Thr Gln Leu Asn His Ala Gly
 3950 3955 3960

 Arg Tyr Thr Cys Val Ala Arg Asn Ala Ala Gly Ser Ala His Arg
 3965 3970 3975

 His Val Thr Leu His Val His Glu Pro Pro Val Ile Gln Pro Gln
 3980 3985 3990

 Pro Ser Glu Leu His Val Ile Leu Asn Asn Pro Ile Leu Leu Pro
 3995 4000 4005

 Cys Glu Ala Thr Gly Thr Pro Ser Pro Phe Ile Thr Trp Gln Lys
 4010 4015 4020

 Glu Gly Ile Asn Val Asn Thr Ser Gly Arg Asn His Ala Val Leu
 4025 4030 4035

 Pro Ser Gly Gly Leu Gln Ile Ser Arg Ala Val Arg Glu Asp Ala
 4040 4045 4050

 Gly Thr Tyr Met Cys Val Ala Gln Asn Pro Ala Gly Thr Ala Leu
 4055 4060 4065

 Gly Lys Ile Lys Leu Asn Val Gln Val Pro Pro Val Ile Ser Pro
 4070 4075 4080

 His Leu Lys Glu Tyr Val Ile Ala Val Asp Lys Pro Ile Thr Leu
 4085 4090 4095

 Ser Cys Glu Ala Asp Gly Leu Pro Pro Pro Asp Ile Thr Trp His
 4100 4105 4110

 Lys Asp Gly Arg Ala Ile Val Glu Ser Ile Arg Gln Arg Val Leu
 4115 4120 4125

 Ser Ser Gly Ser Leu Gln Ile Ala Phe Val Gln Pro Gly Asp Ala
 4130 4135 4140

 Gly His Tyr Thr Cys Met Ala Ala Asn Val Ala Gly Ser Ser Ser
 4145 4150 4155

Thr Ser Thr Lys Leu Thr Val His Val Pro Pro Arg Ile Arg Ser
4160 4165 4170

Thr Glu Gly His Tyr Thr Val Asn Glu Asn Ser Gln Ala Ile Leu
4175 4180 4185

Pro Cys Val Ala Asp Gly Ile Pro Thr Pro Ala Ile Asn Trp Lys
4190 4195 4200

Lys Asp Asn Val Leu Leu Ala Asn Leu Leu Gly Lys Tyr Thr Ala
4205 4210 4215

Glu Pro Tyr Gly Glu Leu Ile Leu Glu Asn Val Val Leu Glu Asp
4220 4225 4230

Ser Gly Phe Tyr Thr Cys Val Ala Asn Asn Ala Ala Gly Glu Asp
4235 4240 4245

Thr His Thr Val Ser Leu Thr Val His Val Leu Pro Thr Phe Thr
4250 4255 4260

Glu Leu Pro Gly Asp Val Ser Leu Asn Lys Gly Glu Gln Leu Arg
4265 4270 4275

Leu Ser Cys Lys Ala Thr Gly Ile Pro Leu Pro Lys Leu Thr Trp
4280 4285 4290

Thr Phe Asn Asn Asn Ile Ile Pro Ala His Phe Asp Ser Val Asn
4295 4300 4305

Gly His Ser Glu Leu Val Ile Glu Arg Val Ser Lys Glu Asp Ser
4310 4315 4320

Gly Thr Tyr Val Cys Thr Ala Glu Asn Ser Val Gly Phe Val Lys
4325 4330 4335

Ala Ile Gly Phe Val Tyr Val Lys Glu Pro Pro Val Phe Lys Gly
4340 4345 4350

Asp Tyr Pro Ser Asn Trp Ile Glu Pro Leu Gly Gly Asn Ala Ile
4355 4360 4365

Leu Asn Cys Glu Val Lys Gly Asp Pro Thr Pro Thr Ile Gln Trp

4370		4375		4380
Asn Arg Lys Gly Val Asp Ile	Glu Ile Ser His Arg	Ile Arg Gln		
4385	4390	4395		
Leu Gly Asn Gly Ser Leu Ala	Ile Tyr Gly Thr Val	Asn Glu Asp		
4400	4405	4410		
Ala Gly Asp Tyr Thr Cys Val	Ala Thr Asn Glu Ala	Gly Val Val		
4415	4420	4425		
Glu Arg Ser Met Ser Leu Thr	Leu Gln Ser Pro Pro	Ile Ile Thr		
4430	4435	4440		
Leu Glu Pro Val Glu Thr Val	Ile Asn Ala Gly Gly	Lys Ile Ile		
4445	4450	4455		
Leu Asn Cys Gln Ala Thr Gly	Glu Pro Gln Pro Thr	Ile Thr Trp		
4460	4465	4470		
Ser Arg Gln Gly His Ser Ile	Ser Trp Asp Asp Arg	Val Asn Val		
4475	4480	4485		
Leu Ser Asn Asn Ser Leu Tyr	Ile Ala Asp Ala Gln	Lys Glu Asp		
4490	4495	4500		
Thr Ser Glu Phe Glu Cys Val	Ala Arg Asn Leu Met	Gly Ser Val		
4505	4510	4515		
Leu Val Arg Val Pro Val Ile	Val Gln Val His Gly	Gly Phe Ser		
4520	4525	4530		
Gln Trp Ser Ala Trp Arg Ala	Cys Ser Val Thr Cys	Gly Lys Gly		
4535	4540	4545		
Ile Gln Lys Arg Ser Arg Leu	Cys Asn Gln Pro Leu	Pro Ala Asn		
4550	4555	4560		
Gly Gly Lys Pro Cys Gln Gly	Ser Asp Leu Glu Met	Arg Asn Cys		
4565	4570	4575		
Gln Asn Lys Pro Cys Pro Val	Asp Gly Ser Trp Ser	Glu Trp Ser		
4580	4585	4590		

49321-59.ST25.txt

Leu Trp Glu Glu Cys Thr Arg Ser Cys Gly Arg Gly Asn Gln Thr
 4595 4600 4605

 Arg Thr Arg Thr Cys Asn Asn Pro Ser Val Gln His Gly Gly Arg
 4610 4615 4620

 Pro Cys Glu Gly Asn Ala Val Glu Ile Ile Met Cys Asn Ile Arg
 4625 4630 4635

 Pro Cys Pro Val His Gly Ala Trp Ser Ala Trp Gln Pro Trp Gly
 4640 4645 4650

 Thr Cys Ser Glu Ser Cys Gly Lys Gly Thr Gln Thr Arg Ala Arg
 4655 4660 4665

 Leu Cys Asn Asn Pro Pro Pro Ala Phe Gly Gly Ser Tyr Cys Asp
 4670 4675 4680

 Gly Ala Glu Thr Gln Met Gln Val Cys Asn Glu Arg Asn Cys Pro
 4685 4690 4695

 Ile His Gly Lys Trp Ala Thr Trp Ala Ser Trp Ser Ala Cys Ser
 4700 4705 4710

 Val Ser Cys Gly Gly Gly Ala Arg Gln Arg Thr Arg Gly Cys Ser
 4715 4720 4725

 Asp Pro Val Pro Gln Tyr Gly Gly Arg Lys Cys Glu Gly Ser Asp
 4730 4735 4740

 Val Gln Ser Asp Phe Cys Asn Ser Asp Pro Cys Pro Thr His Gly
 4745 4750 4755

 Asn Trp Ser Pro Trp Ser Gly Trp Gly Thr Cys Ser Arg Thr Cys
 4760 4765 4770

 Asn Gly Gly Gln Met Arg Arg Tyr Arg Thr Cys Asp Asn Pro Pro
 4775 4780 4785

 Pro Ser Asn Gly Gly Arg Ala Cys Gly Gly Pro Asp Ser Gln Ile
 4790 4795 4800

 Gln Arg Cys Asn Thr Asp Met Cys Pro Val Asp Gly Ser Trp Gly
 4805 4810 4815

Ser Trp His Ser Trp Ser Gln Cys Ser Ala Ser Cys Gly Gly Gly
 4820 4825 4830
 Glu Lys Thr Arg Lys Arg Leu Cys Asp His Pro Val Pro Val Lys
 4835 4840 4845
 Gly Gly Arg Pro Cys Pro Gly Asp Thr Thr Gln Val Thr Arg Cys
 4850 4855 4860
 Asn Val Gln Ala Cys Pro Gly Gly Pro Gln Arg Ala Arg Gly Ser
 4865 4870 4875
 Val Ile Gly Asn Ile Asn Asp Val Glu Phe Gly Ile Ala Phe Leu
 4880 4885 4890
 Asn Ala Thr Ile Thr Asp Ser Pro Asn Ser Asp Thr Arg Ile Ile
 4895 4900 4905
 Arg Ala Lys Ile Thr Asn Val Pro Arg Ser Leu Gly Ser Ala Met
 4910 4915 4920
 Arg Lys Ile Val Ser Ile Leu Asn Pro Ile Tyr Trp Thr Thr Ala
 4925 4930 4935
 Lys Glu Ile Gly Glu Ala Val Asn Gly Phe Thr Leu Thr Asn Ala
 4940 4945 4950
 Val Phe Lys Arg Glu Thr Gln Val Glu Phe Ala Thr Gly Glu Ile
 4955 4960 4965
 Leu Gln Met Ser His Ile Ala Arg Gly Leu Asp Ser Asp Gly Ser
 4970 4975 4980
 Leu Leu Leu Asp Ile Val Val Ser Gly Tyr Val Leu Gln Leu Gln
 4985 4990 4995
 Ser Pro Ala Glu Val Thr Val Lys Asp Tyr Thr Glu Asp Tyr Ile
 5000 5005 5010
 Gln Thr Gly Pro Gly Gln Leu Tyr Ala Tyr Ser Thr Arg Leu Phe
 5015 5020 5025
 Thr Ile Asp Gly Ile Ser Ile Pro Tyr Thr Trp Asn His Thr Val
 5030 5035 5040

Phe Tyr Asp Gln Ala Gln Gly Arg Met Pro Phe Leu Val Glu Thr
 5045 5050 5055

 Leu His Ala Ser Ser Val Glu Ser Asp Tyr Asn Gln Ile Glu Glu
 5060 5065 5070

 Thr Leu Gly Phe Lys Ile His Ala Ser Ile Ser Lys Gly Asp Arg
 5075 5080 5085

 Ser Asn Gln Cys Pro Ser Gly Phe Thr Leu Asp Ser Val Gly Pro
 5090 5095 5100

 Phe Cys Ala Asp Glu Asp Glu Cys Ala Ala Gly Asn Pro Cys Ser
 5105 5110 5115

 His Ser Cys His Asn Ala Met Gly Thr Tyr Tyr Cys Ser Cys Pro
 5120 5125 5130

 Lys Gly Leu Thr Ile Ala Ala Asp Gly Arg Thr Cys Gln Asp Ile
 5135 5140 5145

 Asp Glu Cys Ala Leu Gly Arg His Thr Cys His Ala Gly Gln Asp
 5150 5155 5160

 Cys Asp Asn Thr Ile Gly Ser Tyr Arg Cys Val Val Arg Cys Gly
 5165 5170 5175

 Ser Gly Phe Arg Arg Thr Ser Asp Gly Leu Ser Cys Gln Asp Ile
 5180 5185 5190

 Asn Glu Cys Gln Glu Ser Ser Pro Cys His Gln Arg Cys Phe Asn
 5195 5200 5205

 Ala Ile Gly Ser Phe His Cys Gly Cys Glu Pro Gly Tyr Gln Leu
 5210 5215 5220

 Lys Gly Arg Lys Cys Met Asp Val Asn Glu Cys Arg Gln Asn Val
 5225 5230 5235

 Cys Arg Pro Asp Gln His Cys Lys Asn Thr Arg Gly Gly Tyr Lys
 5240 5245 5250

 Cys Ile Asp Leu Cys Pro Asn Gly Met Thr Lys Ala Glu Asn Gly

5255		5260		5265
Thr Cys	Ile Asp Ile Asp	Glu Cys Lys Asp Gly	Thr His Gln Cys	
5270		5275	5280	
Arg Tyr	Asn Gln Ile Cys	Glu Asn Thr Arg Gly	Ser Tyr Arg Cys	
5285		5290	5295	
Val Cys	Pro Arg Gly Tyr	Arg Ser Gln Gly Val	Gly Arg Pro Cys	
5300		5305	5310	
Met Asp	Ile Asn Glu Cys	Glu Gln Val Pro Lys	Pro Cys Ala His	
5315		5320	5325	
Gln Cys	Ser Asn Thr Pro	Gly Ser Phe Lys Cys	Ile Cys Pro Pro	
5330		5335	5340	
Gly Gln	His Leu Leu Gly	Asp Gly Lys Ser Cys	Ala Gly Leu Glu	
5345		5350	5355	
Arg Leu	Pro Asn Tyr Gly	Thr Gln Tyr Ser Ser	Tyr Asn Leu Ala	
5360		5365	5370	
Arg Phe	Ser Pro Val Arg	Asn Asn Tyr Gln Pro	Gln Gln His Tyr	
5375		5380	5385	
Arg Gln	Tyr Ser His Leu	Tyr Ser Ser Tyr Ser	Glu Tyr Arg Asn	
5390		5395	5400	
Ser Arg	Thr Ser Leu Ser	Arg Thr Arg Arg Thr	Ile Arg Lys Thr	
5405		5410	5415	
Cys Pro	Glu Gly Ser Glu	Ala Ser His Asp Thr	Cys Val Asp Ile	
5420		5425	5430	
Asp Glu	Cys Glu Asn Thr	Asp Ala Cys Gln His	Glu Cys Lys Asn	
5435		5440	5445	
Thr Phe	Gly Ser Tyr Gln	Cys Ile Cys Pro Pro	Gly Tyr Gln Leu	
5450		5455	5460	
Thr His	Asn Gly Lys Thr	Cys Gln Asp Ile Asp	Glu Cys Leu Glu	
5465		5470	5475	

49321-59.ST25.txt

Gln Asn Val His Cys Gly Pro Asn Arg Met Cys Phe Asn Met Arg
 5480 5485 5490

Gly Ser Tyr Gln Cys Ile Asp Thr Pro Cys Pro Pro Asn Tyr Gln
 5495 5500 5505

Arg Asp Pro Val Ser Gly Phe Cys Leu Lys Asn Cys Pro Pro Asn
 5510 5515 5520

Asp Leu Glu Cys Ala Leu Ser Pro Tyr Ala Leu Glu Tyr Lys Leu
 5525 5530 5535

Val Ser Leu Pro Phe Gly Ile Ala Thr Asn Gln Asp Leu Ile Arg
 5540 5545 5550

Leu Val Ala Tyr Thr Gln Asp Gly Val Met His Pro Arg Thr Thr
 5555 5560 5565

Phe Leu Met Val Asp Glu Glu Gln Thr Val Pro Phe Ala Leu Arg
 5570 5575 5580

Asp Glu Asn Leu Lys Gly Val Val Tyr Thr Thr Arg Pro Leu Arg
 5585 5590 5595

Glu Ala Glu Thr Tyr Arg Met Arg Val Arg Ala Ser Ser Tyr Ser
 5600 5605 5610

Ala Asn Gly Thr Ile Glu Tyr Gln Thr Thr Phe Ile Val Tyr Ile
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Ala Val Ser Ala Tyr Pro Tyr
 5630 5635

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<211> 22

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6 exon 104-specific forward primer used for DHPLC assay

<400> 3

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22

<210> 4

<211> 20

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6 exon 104-specific reverse primer for DHPLC assay

<400> 4

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20

<210> 5

<211> 21

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6-specific forward primer for ASO assay

<400> 5

tatcatggca tacgagcaga c

21

<210> 6

<211> 22

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6-specific reverse primer for ASO assay

<400> 6

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22

<210> 7

<211> 17

<212> DNA

<213> artificial sequence

<220>

<223> oligonucleotide probe specific for wildtype A allele at nucleotide position 16,263 of FIBL-6 cDNA sequence (SEQ ID NO:1)

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17

<210> 8

<211> 17

<212> DNA

<213> artificial sequence

<220>

<223> oligonucleotide probe specific for mutant G variant at nucleotide position 16,263 of FIBL-6 cDNA sequence (SEQ ID NO:1)

<400> 8

accaggacga catttat

17

<210> 9

<211> 21

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6 exon 103-specific common upstream forward primer used to differentiate alternative splicing involving exon 104

<400> 9

caagaagcag ctatcgttgt g

21

<210> 10

<211> 23

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6 exon 104-specific downstream reverse primer used to differentiate alternative splicing involving exon 104

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23

<210> 11

<211> 21

<212> DNA

<213> artificial sequence

<220>

<223> FIBL-6 exon 105-specific downstream reverse primer used to differentiate alternative splicing involving exon 104

<400> 11

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21